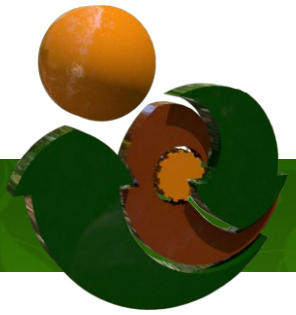

Earth Cycle Technologies

Certification, Consultancy & Pre-Certification Inception Booklet

For Certification of Passive House Buildings

The Four Stages of Passive house Certification

There are four stages to Passive house Certification;

1. Consultancy
2. Thermal Bridging
3. Final Certification
4. Accessories

If Earth Cycle Acts as the certifier we can only verify the consultants work and cannot act as both the consultant and Certifier.

Earth Cycle has many external certifiers and thermal bridging consultants who can carry out the work in addition to any you may have.

The same goes for thermal bridging only the consultant (if us or you) or a third party can carry this out.

Whether you would like us to certify or consult we have the resources and external contacts to offer the services for the prices given and can give an entire package albeit with external consultants/certifiers.

The Six Scenario's for Passive House Certification

Are you a:

1. Consultant Looking for Pre Construction Check & Final Certification
2. Certifier Looking for Pre Construction Check & Final Certification
3. Architect Looking for Pre Construction Check & Final Certification
4. Client Looking for Pre Construction Check & Final Certification

Or

5. Consultant/Certifier Looking for Final Certification
6. Architect or Client Looking for a Consultant without Certification

Fee's for Each Given stage

For stages 1-4 of the above scenarios the fee's are calculated for a single family house based on requirements using the "certification application form" on www.earthcycle.co/certification

The standard fee for final certification/consultancy of a single family house in stages 5 &6 is €1650 with €150 discount if a designPH model is provided.

Payments for any given stage are issued as follows;

- 25% inception deposit before commencement

- A further 50% upon and before issue of the first full review
- Final 25% to finalize

Fee's for commercial/large scale residential are calculated on specific basis and detailed in the same 4 stages in appendix A at the foot of this document.

Stage 1 Consultancy

Items Needed

To commence we will need;

- A Google map link to the site location,
- Photographs of the surroundings,
- A Site Plan Site Showing Surrounding Buildings, tree's hedges with heights,
- Any products or idea's you have for building fabric, windows and doors/mech/vent,
- The Building Elevations and Sections, and,
- All Floor Plans,

We will then take this and create a PHPP model to determine or evaluate;

- The specification needed to meet the target standard
- An overview of Overheating
- An overview of Primary Energy
- A review of the construction details (qualitive thermal bridging needed also)
- A review of Ventilation
- A review of Mechanicals

We will report all and once complete & invoice for the given stage.

Stage 2 Thermal Bridging

Items Needed

To commence we will need;

1. Drawings for ALL relevant junctions of the thermal envelope,
2. Confirmation that You have reviewed and provided all details for Your project, and,
3. Technical Data sheets stating thermal conductivity of the materials used.

Drawings

Important information that must be added to the drawings for calculation are;

1. Dimensions of all Parts
2. Thermal Conductivities of all materials (listed on the drawing not ref to spec)
3. Centre's of Wood/Steel Studs
4. Profile of Steel Studs in both Directions.
5. Gauge of Steel Studs
6. Thickness of Timber Studs
7. Position of Membranes and Flashings (Highlighted with colour to make extremely clear)

We will report all and once complete & invoice for the given stage.

Stage 3 Final Certification & The Info Needed

The final Certification is filed on the PHI certification Platform. This is normally part carried out at the consultancy stage once the process has been carried out.

There are 9 Sections to fill out in an accordion type system with a green, orange and red light system.

Green being complete, orange under review and red for outstanding. Under each section there are sub sections for entry of documents to the relevant parts of that section.

Once all are filled the project is manually sent to PHI for checking and within 3-5 days an ID for the project is issued which can be used to print the certificate.

3 Certification 1.0 PHPP

1.1 Completed PHPP File

Here You can add your designPH & PHPP for the consultancy

To save on duplicates and confusion we normally email you our PHPP as the project progresses and only upload the final PHPP at the end.

1.2 EnerPHit Retrofit Plan

Contact us for samples. This plan outlines the measures and methodologies taken in both step by step and EnerPHit Retrofits.

1.3 Map Link

Just like that in consultancy we need a google maps link to the site location.

3 Certification 2.0 PHPP

2.1 Photographs Site and of Surroundings

Here You must add your photographs on site looking in every direction on the site. As many as possible are needed and if a lot of files simply zip them and add as one if need be.

2.2 Site Location Plan

- **include neighbouring buildings**
- **height above sea level**
- **1/500-1/1000 scale**
- **Specify project's exact adress**
- **Mark the envelope to be certified**
- **Mark the North orientation**
-

2.3 Floor Plans

Here You must add you floor plans for all floors some important info;

- **(scale: 1:50 or 1:100, file format: dwg, pdf, dxf);**
- **Outline the external dimensions of the thermal envelope;**
- **Name all windows/doors separately and assign the same names in PHPP/Windows;**
- **Outline the areas where the room height is below 2.00 m, respectively 1.00m;**
- **Name every interior space and define it's surface clearly;**
- **Mark all the cross sections on the floor plans;**
- **Write the calculated Treated Floor Area (TFA) on all floorplans;**
- **Mark any non-heated adjacent spaces;**

2.4Cross Sections

Enough cross sections to explain the thermal envelope in detail. Similar to floor plans.

2.5Elevations

- **Scale: 1:50 or 1:100, file format: dwg, pdf, dxf;**
- **Show exterior dimensions of the building envelope for each type of outside wall, to check that PHPP/Areas match areas on the drawing;**
- **Name all windows/doors separately and assign the same names in PHPP/Windows;**
- **For semi-buried walls, the level of terrain along the facade must be clearly shown by a continuous line;**
- **Mark all exterior air vents(supply and exhaust) on the facades, and highlight the distances from ground;**
- **Mark every type of cladding used;**

2.6Treated Floor Area

This will be calculated or verified by us using designPH no action needed

2.7Internal Air Volume

This is calculated by the air tightness tested and verified by us. At Prelim test stage please send confirmation/request to calculate air volume. If guidance is needed please contact for documents and samples.

2.8Information about Shading Objects

Any other foreseen shading situations not shown in your package. Mountains/Future Development??

3 Certification 3.0 Standard and Connection Details

3.1.1 Same as in Stage 1 Thermal Bridging Drawings above.

3.2.1-6 Calculated thermal bridge coefficients to international ISO norms.

3 Certification 4.0 Windows and Doors

A certificate stating the individual thermal and solar properties of all Windows, Doors, Sliders and Roof/Skylights/Hatches is needed.

A numbering System Should be labelled on all elevations and plans indication the window number, frame and glass type.

Samples of certificates can be obtained of any system by contacting us.

4.1 **Can be on the plans**

4.2 **Glazing – This is for all glass types – values to two decimals – EN Standards ISO 410 and 673**

4.3 **Frames – Again for all Frame Types ISO EN 10077-2**

4.4 **Doors – Solid Door U-values**

4.5 **Skylights – Ditto**

Passive house certified systems are the easiest and most comforting aveues to ensuring comfort and reliability.

IF No Test data or Certification exists, we can provide values and see if products are suitable for a fee determined on case by case basis however this will dramatically slow the process.

3 Certification 5.0 Ventilation

The best way to ensure reliable ventilation efficiency data is to use a PHI certified system.

No guarantee can be given for non-certified systems,

If you do not have a certified ventilation unit you must have at least the test results for 3 ambient temperature conditions where the ODA, EHA, EXT, SUP air temperatures are recorded.

ODA Outdoor Air
EHA Exhaust Air
EXT Extract Air
SUP Supply Air

We can then (at an additional charge) estimate the efficiency for you project. This info if not tested correctly under the right conditions or flows can cause major time delays and cost.

If neither exist (PHI Cert/Test Report) the ventilation unit cannot be used and the building cannot be certified.

Otherwise if Certified Units are used it's quite simple.

5.1 Ventilation Concept

Simply How the building is ventilated and the association with heating/pre heating /frost protection. The type of ductwork used, the insulation on the external air ducts to the envelope, the length of the ducts to the envelope, the type of system and anything else that describes the concept.

5.2 Technical Drawings

The ventilation layout showing pipe diameters, flor rates, distribution boxes, taping strategy of ducts, insulation levels on all, decoupler types and mechanical room layout

5.3 Specification Sheet for the HRV/ERV

As above or simply the PHI Cert

5.4 Ventilation Components

All Ducts / Insulation / Dampers / Frost protections / Post heaters / Heating Coils / distribution boxes / suitable airtightness tapes for junctions & Junction Boxes / Silencers / Sound Transfer protection de-couplers)

NOTE The use of foil type de-coupler products is not permissible in Passive House Projects with Earth Cycle Tech NOR are Foil Flexi ducts or Foil Type Sound attenuators.

Foil insulation can only be used if diffusion tight type insulation exists below it

Photographs of the mechanical room must be taken before and after insulating ducts and pipework.

5.5 Pressure losses

Calculated by mechanical team on site.

5.6 Subsoil Heat Exchanger

1. **Wattage of the Pumps**
2. **A Layout for the loops**
3. **Piping details**
4. **Efficiency**

2 Certification 6.0 Heating Cooling and Plumbing

6.1 Description

A simple description of how the building is heated and cooled and how domestic hot water is produced.

6.2 Technical Drawings for Heating

Drawings showing the pipework, components, heating generators inside and outside the building

6.3 Technical Drawings for Water Distribution

Drawings showing the pipework, components, and insulation for cold water feeds.

6.4 Technical Drawings for Cooling

Drawings showing the pipework, components, cooling generators inside and outside the building

6.5 Heat Generator for Heating

Whether a; Boiler, Heat Pump, District System or Compact unit. A technical document stating the efficiency of whichever system you use is needed.

6.6 Heat Storage

The tank used for hot water storage must be well insulated to stop gains in summer and keep the efficiency up. The total losses in W/K is needed for the tank entirety. If this is not available we can calculate for a fee determined on a project basis.

6.7 Distribution Of Heating

For all heating and hot water piping networks a layout is needed showing their lengths, diameters and insulation thicknesses. The hot water tank (if used) must also be shown and details of its size and insulation thickness.

6.8 Heat Generator for Hot Water

If the same as for heating no action needed if different the same info as above is needed.

6.9 Distribution of Hot Water

As Above for heating, be sure to include interior and exterior pipes.

6.10 Description of the cooling system

For air-conditioning systems albeit; re-circulating systems, panel cooling or ducted. A layout of the position of the compressors, the evaporators and the flow rates for each of these.

6.11 Drainage pipes Conduits and Ducts with Outdoor Contained Water or Air.

If there are ducts/pipes containing cold air/water inside the envelope, please let us know as these must be calculated in 3D and added to the energy balance. These are normally estimated for normal conditions but any additional can adversely affect especially Soil Vent Pipes and Rainwater Downpipes.

3 Certification 7.0 Electricity

7.1 Concept

A simple description of the electrical consumption. Make sure to explain if there are any special items such as pool's, lifts, commercial kitchens, home cinema, gym equipment etc.

Please also state the building use.

7.2 Technical Drawings

Lighting Layout/Electrical Layout etc. Add wattage consumptions of all electrical fixtures

7.3 Appliances

Technical Data Sheets for all appliances or Energy Ratings.

2 Certification 8.0 Electricity

8.1 Thermal Solar

- **technical data sheet(s) of the solar panel(s)**
- **number of panels, orientation, angle of inclination**
- **neighbouring shading objects**

8.2 Solar PV

- **technical data sheet(s) of the solar panel(s)**
- **number of panels, orientation, angle of inclination**
- **neighbouring shading objects**
- **inverter**
- **batteries**

Completion of the Certification for a Final Certificate

The final four items that need to be submitted are:

a. Photos of Product Labels
b. Photo Documentation of Insulation Thicknesses
c. The Air-Tightness Test
d. The Ventilation Balancing

Photos of Labels (Optional if Unknown)

All insulation materials, windows, glazing units, doors, heating components and ventilation units will have a sticker or a plate on which the model number or specification for that component lies.

All of these (wherever different, duplication not necessary) should be photographed on site and filed with the certification.

This ensures the correct units have been delivered and for future reference when all are covered by finishes; proves the internals that can't be seen.

Photo Documentation of Insulation Thickness (Optional if Unknown)

A photograph of the insulation thickness shown by means of a camera and a tape measure is needed for all insulation products and thermal breaks installed. An example of such is shown below. This also proves that the thicknesses as specified were installed on site

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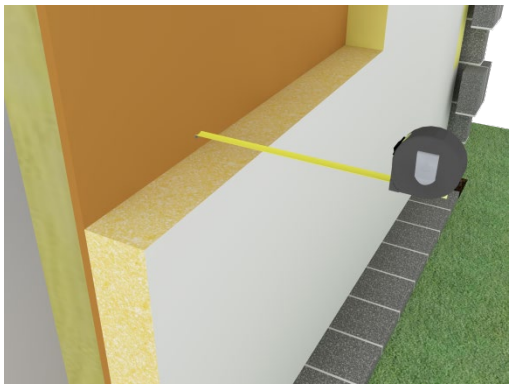
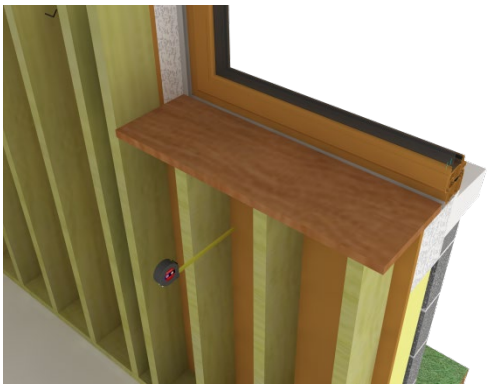




This should be repeated for all assemblies giving reasonable context in the background to identify the relative outer walls. ie, an image standing back from the assemblies should be taken so that this is achieved.

Insulated piping and ductwork must all also be photographed in the same way.

Air-tightness test

This test must be; carried out by, or; signed off by; someone independent of the client, consultant or developer/homeowner.

It is a separate test which must be provided by a sub-consultant and is crucial to the overall project.

It's advised that Passive Houses should be completed only as far as the air-tight layer and before finishes or screeds/gypsum is applied a preliminary test should be carried out for leak detection and remediation.

The final test however, is carried out when the building is completed and all finishes are applied.

All tests must be carried out in accordance with the Passive House Procedures (contact if assistance is needed) with both pressurization and de-pressurization.

Ventilation Balancing

Lastly the ventilation balancing must be completed to ensure that the correct amount of air is being delivered to each room. If the machine is unbalanced it can also cause other mechanical issues.

If you are having difficulty with the ventilation commissioning, we can consult on this for agreed charges.

For Certification we will simply need the recorded flow rates at each register and for the outside grill's and extract vs supply must be within 10% of each other.

Completion

Once complete, you will be asked to sign a declaration that the building had been constructed exactly as per the documents that were submitted.

After a brief checking by PHI as long as there are no issues the Certification is completed, at which point we can issue the certificate to You!

For a small additional fee a Passive House Plaque can be purchased for the building and your status as consultant will also be renewed to a new term.

Fees

The fee's for certification for any single once off dwelling can be found in the attached Application Form on www.earthcycle.co . A 25% deposit is required for commencement of any stage and payment up to 75% is required after the first entire review. The final 25% is due on completion of the stage but before issuing.

For large scale projects and non residential projects, all fee's are determined on a case by case basis of size, scale and complexity. The details of which can be found in Annex A.

If you cannot provide thermal bridging this stage must be added and is required for all projects. Details can be found in the thermal bridging section under services. A low-cost thermal bridging course for Passive House exists on the website that will upgrade a consultant and empower them with the skills necessary. A review of one iteration of the thermal bridging is included with the certification.

Revisions, Updates & Additional Consultancies

Revisions and updates are charged at an additional €65 / Hour (agreed in advance but before continuing). If a situation arises where revisions are needed, and this is not agreed the project can be discontinued.

If you have assemblies that we are concerned about. Moisture studies, if deemed necessary will cost up to €650 per assembly. Care should be taken by consultants not to create an assembly that is likely to sweat or gather moisture. The use of certified systems is advisable.

Commencing Works

Should you wish to commence, all that is required is the 25% commencement fee, the fee calculator and the below signed document;

I……Homeowner of project addressed……

Agree to the above terms conditions and fee's for our project at……..

……..

Signed……

And

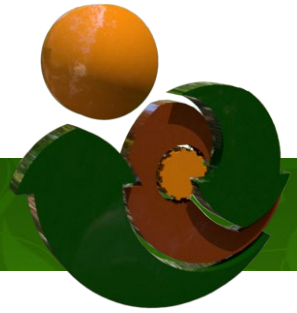
I ……Of ……..Consultant for the project

addressed……..

……have read all the required documentation in this booklet and agree to submit all information needed for certification.

Signed……

Many thanks for your custom.



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