
Scaling Sustainability

How ALTU combines BIM and
PHPP to deliver large scale
Passive House developments

Guillermo
Fernández
Camacho

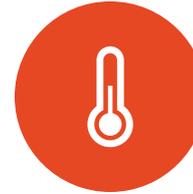


Why Passive House?

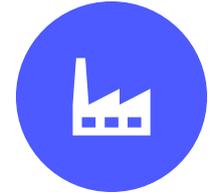
Because it is an energy standard that delivers ultra low energy use and exceptional indoor comfort. This is achieved using a fabric first approach with rigorous limits on heating demand, primary energy and overheating, which are verified through energy modelling (PHPP), on-site testing and evidencing



**NO PERFORMANCE
GAP**



**THERMAL
COMFORT**

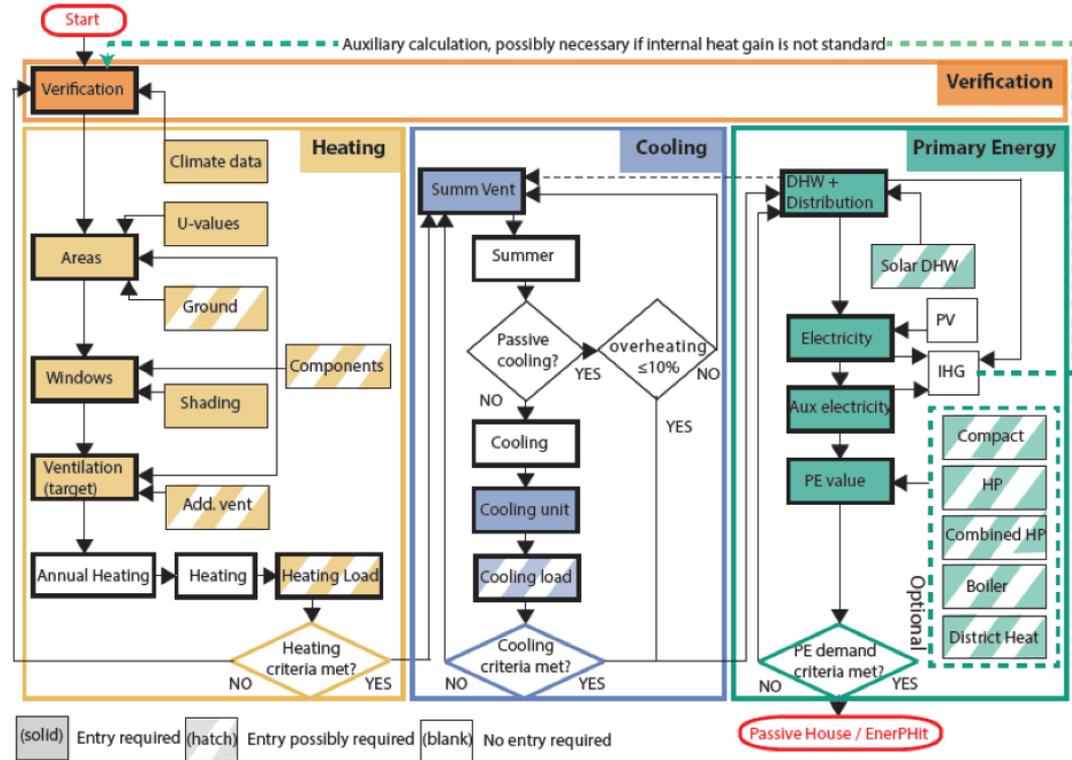


**REDUCED ENERGY
USE AND CO₂**

Passive House Planning Package (PHPP)

The PHPP is a scientifically validated steady state energy modelling tool based on Excel. It captures the impact of individual components (assemblies, windows, shading, ventilation, etc.) on the energy balance and enables their design and dimensioning

Image source: PHPP Illustrated: a designer's companion to the Passivhaus Planning Package by Sarah Lewis

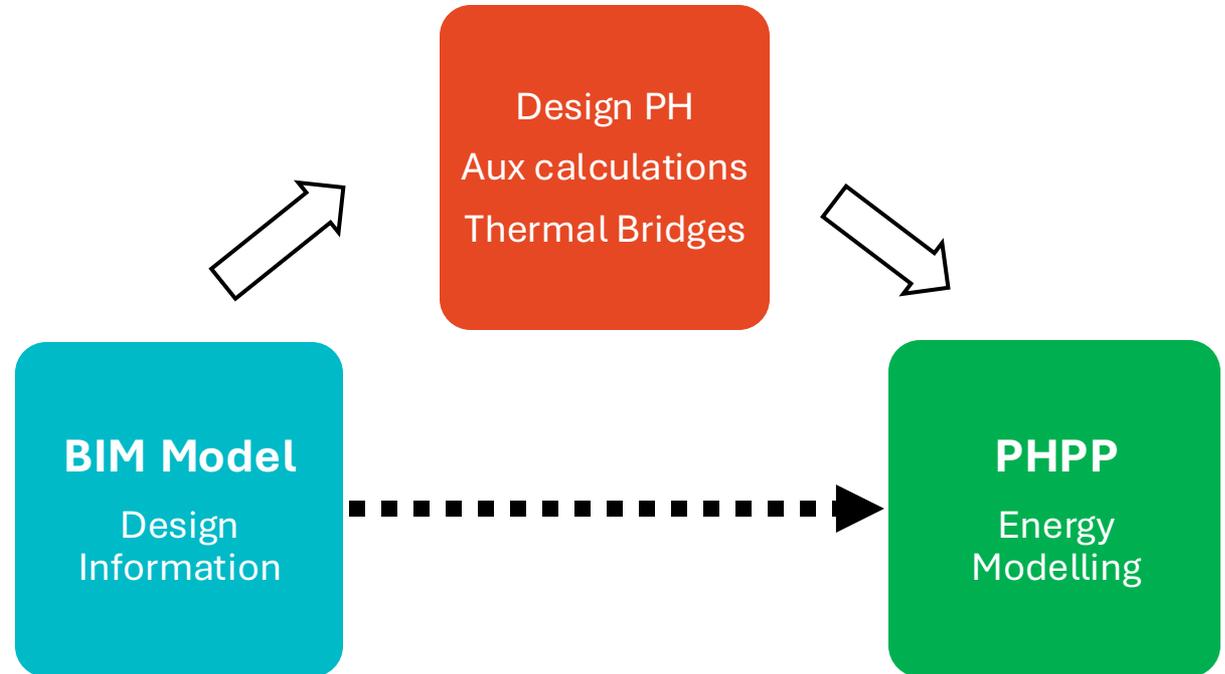


Bridging BIM and PHPP

There are two main limitations when it comes to creating the PHPP model for large scale residential developments:

- There is no direct way to export the design information from BIM to PHPP
- The Passive House standard was originally developed for smaller scale buildings

To overcome this, in Altu we have developed a workflow to transfer the design information into PHPP



21042 Seven Mills Block E+F

- CLB-T2-06-BEF-ZZZ-IE-AA-AR-9200
- CLB-T2-06-BEF-ZZZ-IE-AA-AR-9100
- CLB-T2-06-BEF-ZZZ-IE-AA-AR-XXXX Str...
- CLB-T2-06-BEF-ZZZ-IE-AA-AR-XXXX OC...
- 1100 Series - GA Construction Plans B...
- 1050 Proposed Blocks-E+F Sub-Flo...
- 1100 Proposed Blocks-E+F Level 00...
- 1101 Proposed Blocks-E+F Level 01...
- 1102 Proposed Blocks-E+F Level 02...
- 1103 Proposed Blocks-E+F Level 03...
- 1104 Proposed Blocks-E+F Level 04...
- 1105 Proposed Blocks-E+F Level 05...
- 1106 Proposed Blocks-E+F Level 06...
- 1107 Proposed Blocks-E+F Roof Plan
- 1300 Series - GA Setting Out Plans Blo...
- 1350 Series GA Brickwork Plans Block...
- 1400 Series - Partition Type Plans /1:2...
- 1400 Proposed Blocks-E+F Level 00...
- 1401 Proposed Blocks-E+F Level 00...
- 1402 Proposed Blocks-E+F Level 00...

BIM Model

CLB-T2-06-BEF-ZZZ-IE-AA-AR-9...
 Published Mar 2, 2025, 1:28:01 PM
 3D Model Size 475.8 MByte



Auxiliary calculations

- Treated Floor Area (TFA)
- Net air volume for pressurisation test (Vn50)
- MVHR and DHW duct lengths
- DHW pipe lengths
- Ventilation air flow rates
- Electricity consumption (appliances, lifts, pumps, etc.)

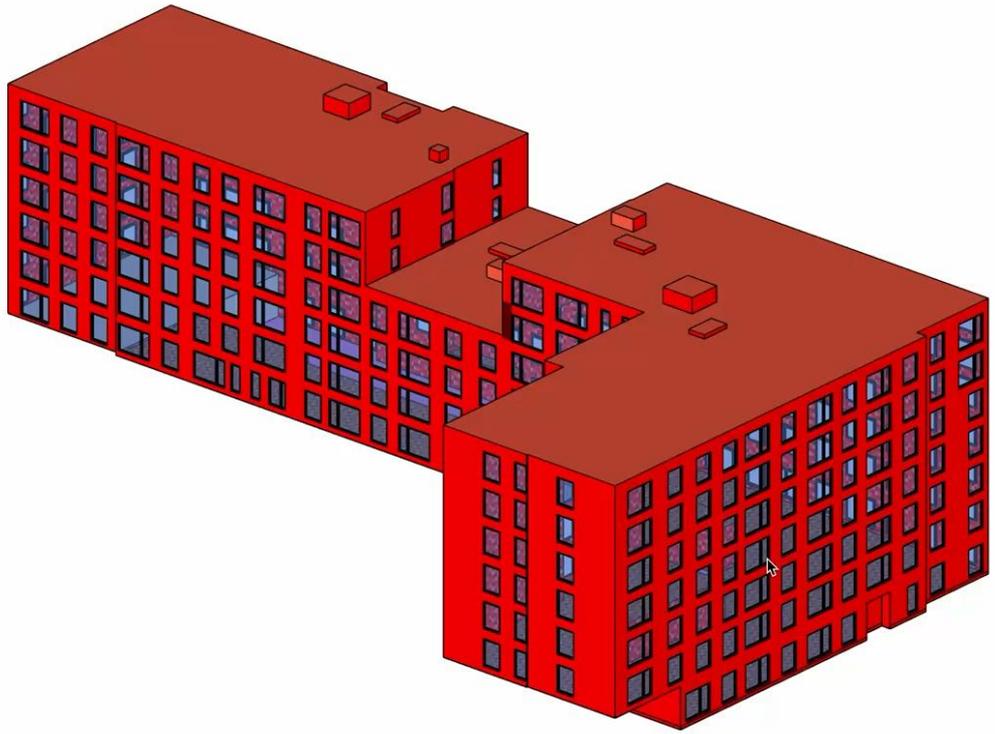


Scene 1



Climate: 1E0001b - Dublin
Building: Dwelling
Qh: 4.0
TFA: 91
Heat Loss Form Factor: 0.99

Design PH



Thermal bridges

- Main:
- Design
- Viewpoint
- Document



Home Ribbon: Paste, Cut, Copy, Format, Arial, 14, Wrap Text, Number, Conditional Formatting, Format as Table, Cell Styles, Insert, Delete, Format, Auto-sum, Fill, Clear, Sort & Filter, Find & Select, Sensitivity, Analysis, Data.



Output: PHPP (MBER(Heating!Q78),Heating!Q78,"")
 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35
 A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

Passive House-Verification

ARCHITECTS R
 10.6 EN
 PHPP



Building:	Block F T2 Seven Mills		
Street:	Clonburris		
Postcode/City:	Dublin 22		
Province/Country:		IE-Ireland	
Building type:	5-Multi-family house Apartment building		
Climate data set:	IE0001b-Dublin, Altitude corrected		
Climate zone:	3: Cool-temperate	Altitude of location:	59 m
Home owner / Client:	Cairn Homes		
Street:	45 Mespil Road		
Postcode/City:	D04 W2F1	Dublin 4	
Province/Country:	Dublin	IE-Ireland	
Mechanical engineer:	OCSC		
Street:	9 Prussia Street		
Postcode/City:	D07 KT57	Dublin	
Province/Country:		IE-Ireland	
Certification:	Mosart		
Street:	Wicklow County Campus, Clemont House		
Postcode/City:	A67 X566	Rathnew	
Province/Country:	Co. Wicklow	IE-Ireland	
Interior temperature winter [°C]:	20.0	Interior temp. summer [°C]:	25.0
Internal heat gains (IHG) winter [W/m²]:	2.8	IHG summer [W/m²]:	3.2
Specific heat capacity [Wh/K per m² TFA]:	132	Mechanical cooling:	

Architecture:	Altu Architecs		
Street:	14 - 15 Camden street		
Postcode/City:	D02 RP27	Dublin	
Province/Country:		IE-Ireland	
Energy consultancy:	Altu Architecs		
Street:	14 - 15 Camden street		
Postcode/City:	D02 RP27	Dublin	
Province/Country:		IE-Ireland	
Year of construction:	2025		
No. of dwelling units:	129		
No. of occupants:	239.0		

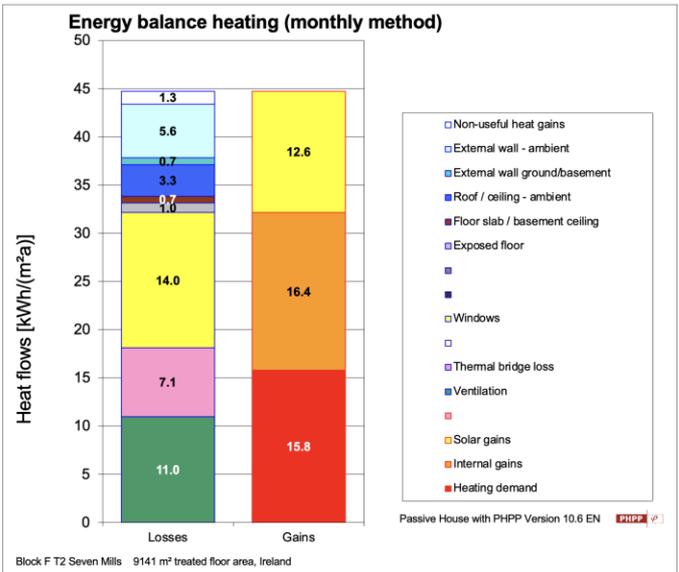
Specific building characteristics with reference to the treated floor area		Criteria	Alternative criteria	Fulfilled?²
Treated floor area m²	9140.8	15	-	
Space heating Heating demand kWh/(m²a)	15.70			



Designed for Delivery



Turning Passive House principles into real-world performance



**Thank you for
listening!**

.ALTU
ARCHITECTS
