

1. Project Documentation

Ahuru Passive House, Waikato 3200, New Zealand.

PHI ID: 7954



Ahuru Passive House, Waikato 3200, New Zealand

Data of building			
Year of construction	2021	Space heating Heizwärmebedarf	14.6 kWh/(m ² a)
U-value external wall U-Wert Außenwand	0,142 W/(m ² K)		
U-value floor slab	0,240	Primary Energy Renewable (PER)	70.3
	W/(m ² K)	Erneuerbare Primärenergie (PER)	kWh/(m ² a)
U-value roof U-Wert Dach	0,157	Generation of renewable Energy	74.3
	W/(m ² K)	Erzeugung erneuerb. Energie	kWh/(m ² a)
U-value window U-Wert Fenster	1.06	Non-renewable Primary Energy (PE)	30.8
	W/(m ² K)	Nicht erneuerbare Primärenergie (PE)	kWh/(m ² a)
Heat recovery Wärmerückgewinnung	76.3%	Pressurization test n ₅₀ Drucktest n ₅₀	0,35 h ⁻¹
Special features Besonderheiten	Certified Passive House Plus through onsite solar energy system – ground-mount for cleaning and maintenance.		

Brief Description

Passive House plus - AHURU - WAIKATO

This is a Certified Passive House Plus in New Zealand. It is situated in a rural setting in the Waikato region. The project brief was to build a certified Passive House with a minimalistic approach that would capture the views from the site. The house is single level, with external timber walls and roof systems, and a concrete slab foundation. The design is a single stand-alone dwelling build for performance and tailored to the owners' living requirements.



2. Responsible project participants

Verantwortliche Projektbeteiligte

Architect Entwurfsverfasser	Brooke Cholmondeley-Smith – TAWA Architecture Ltd https://www.tawaarch.co.nz
Implementation planning Ausführungsplanung	Brooke Cholmondeley-Smith – TAWA Architecture Ltd https://www.tawaarch.co.nz
Building systems Haustechnik	Fantech NZ Limited
Structural engineering Baustatik	JD Consulting Engineers Ltd
Building physics Bauphysik	Sustainable Engineering Ltd https://sustainableengineering.co.nz
Passive House project planning Passivhaus-Projektierung	Brooke Cholmondeley-Smith – TAWA Architecture Ltd https://www.tawaarch.co.nz
Construction management Bauleitung	Brown Construction Ltd

Certifying body

Zertifizierungsstelle

Sustainable Engineering Ltd
<https://sustainableengineering.co.nz>

Certification ID

Zertifizierungs ID

7954

- Project-ID https://passivehouse-database.org/index.php?lang=en#d_7954

Author of project documentation

Verfasser der Gebäude-Dokumentation

Brooke Cholmondeley-Smith – TAWA
Architecture Ltd <https://www.tawaarch.co.nz>

Date
Datum
08.09.2025

Signature
Unterschrift



3. Ansichtsfotos

© TAWA



North Facade



West Facade



East Facade

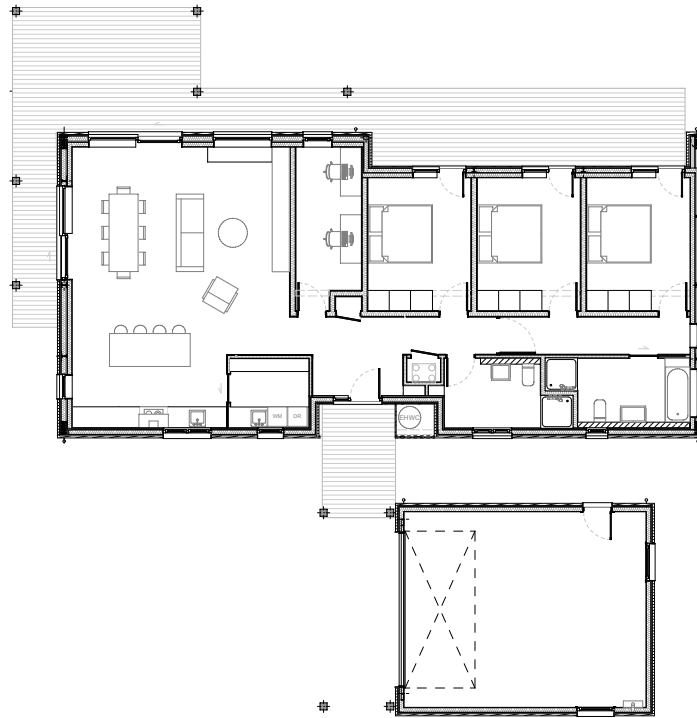


South Facade

4. Innenfoto exemplarisch

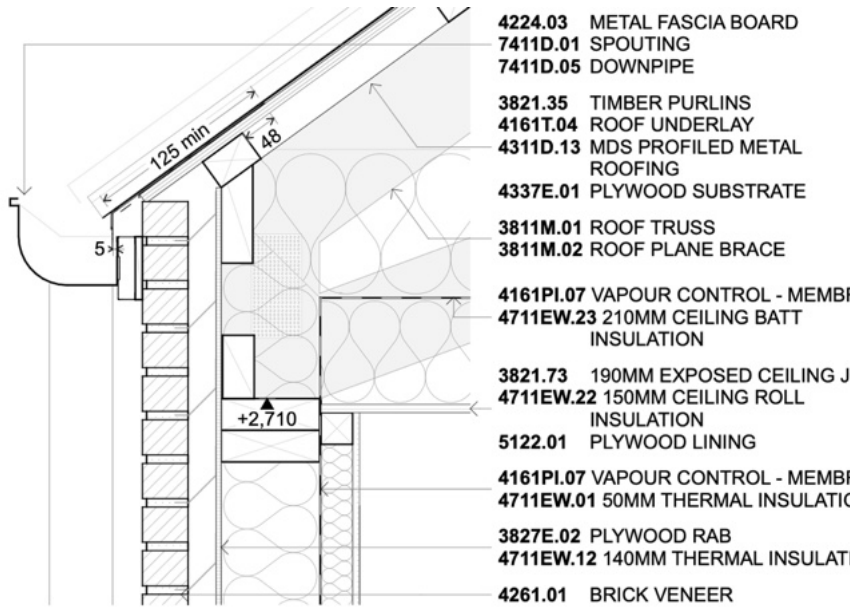


6. Grundrisse



Floor plan of PH – indicating separate garage building

8. Konstruktion der Außenwände



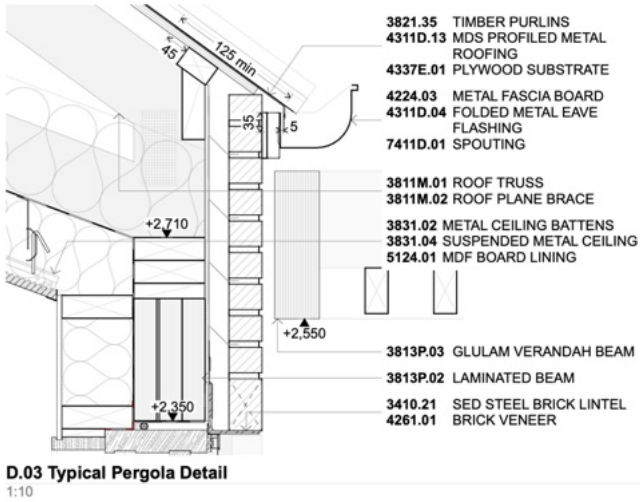
Advanced timber frame system with Intello air-tightness layer/tapes and insulation batts situated between the timber framed walls or service frame. Structural steel was kept outside the thermal and air-tightness envelope. Thermal bridge modelling was carried out to confirm compliance.



D.01 Typical Gutter Detail
1:10

Assembly no.		02ud				Wall_02		Interior insulation?	
Orientation of building element		2-Wall		Adjacent to		3-Ventilated		Heat transmission resistance [m ² K/W]	
								interior R _{si} 0.13	
								exterior R _{se} 0.13	
Area section 1	λ [W/(mK)]	Area section 2 (optional)	λ [W/(mK)]	Area section 3 (optional)	λ [W/(mK)]	Thickness [mm]			
Plasterboard	0.250					13			
GlassfibreKnaufExt WallR3.2@140mm	0.044	Timber framing	0.130			140			
GlassfibreKnaufExt WallR3.6@140mm	0.039			Timber framing	0.130	140			
KnaufMasonry WallR.15@50mm	0.033			Timber framing	0.130	50			
Percentage of sec. 1		Percentage of sec. 2		Percentage of sec. 3		Total			
72%		14.0%		14.0%		34.3 cm			
U-value supplement				U-value:		0.142 W/(m ² K)			

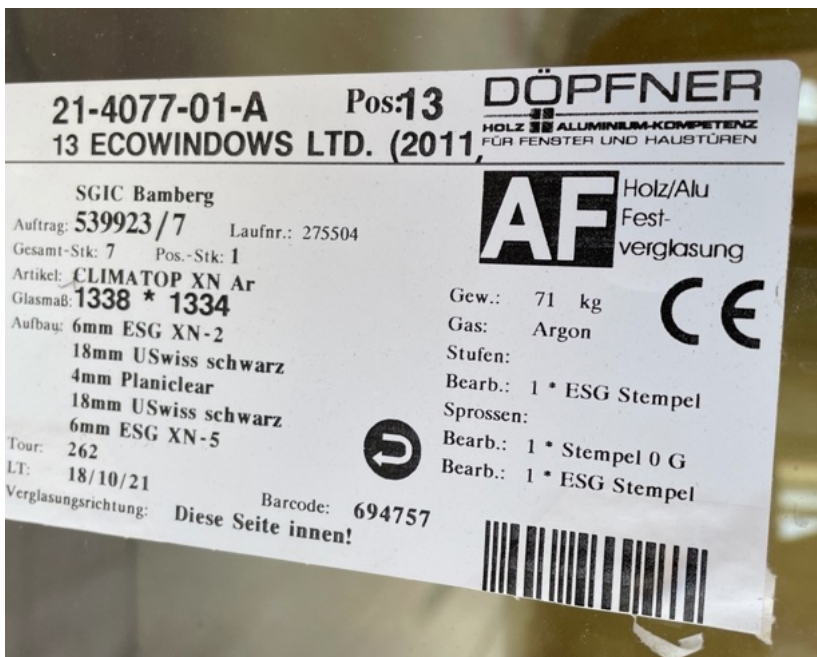
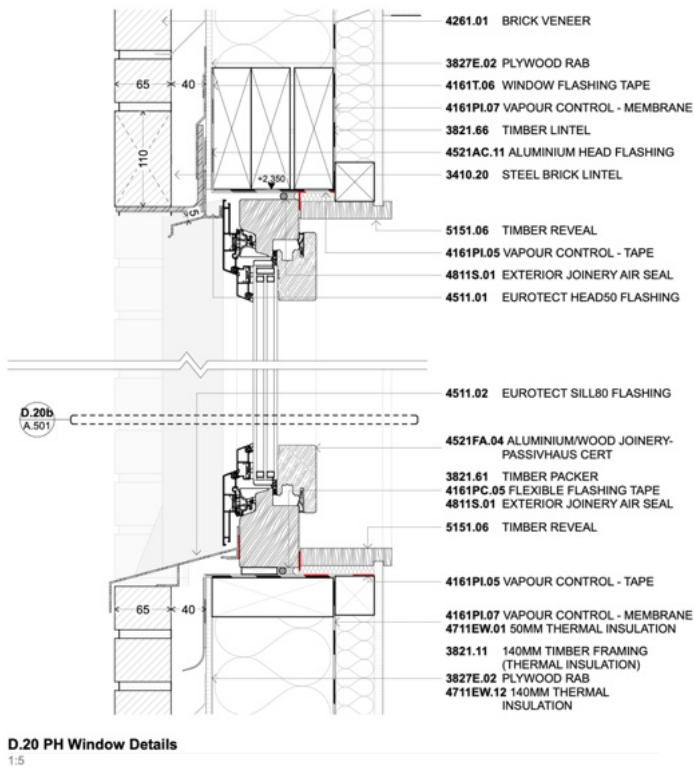
9. Konstruktion des Daches



The structural timber wall system has the timber trusses connected to the top-plate. Care taken for air-tightness layer and insulation to be continuous from wall to ceiling for compliance and thermal performance. The timber trusses have two layers of thermal insulation blanket at the ceiling level. The ceiling uses an air-tight membrane to make the ceiling meet the PH air-tightness criteria. A suspending ceiling cavity was created inside the thermal & air-tightness layer for reticulation of HRVU, electrics, plumbing, etc.

Assembly no.						Interior insulation?
04ud	Roof	Heat transmission resistance [m ² K/W]				
Orientation of building element		interior R _{si}		exterior R _{se}		
1-Roof		0.10		0.10		
Adjacent to						
3-Ventilated						
Area section 1	λ [W/(mK)]	Area section 2 (optional)	λ [W/(mK)]	Area section 3 (optional)	λ [W/(mK)]	Thickness [mm]
Plasterboard	0.250					13
Service Cavity_GlassfibreKnaufRoofBlanketRollR3.2@135mm	0.042					135
GlassfibreKnaufRoofBlanketRollR3.6@150mm	0.042	Timber bottom chord	0.130			150
Percentage of sec. 1		Percentage of sec. 2		Percentage of sec. 3		Total
85%		15.0%				29.8 cm
U-value supplement		U-value: 0.157 W/(m ² K)				

10. Fenster und Fenster-Einbau



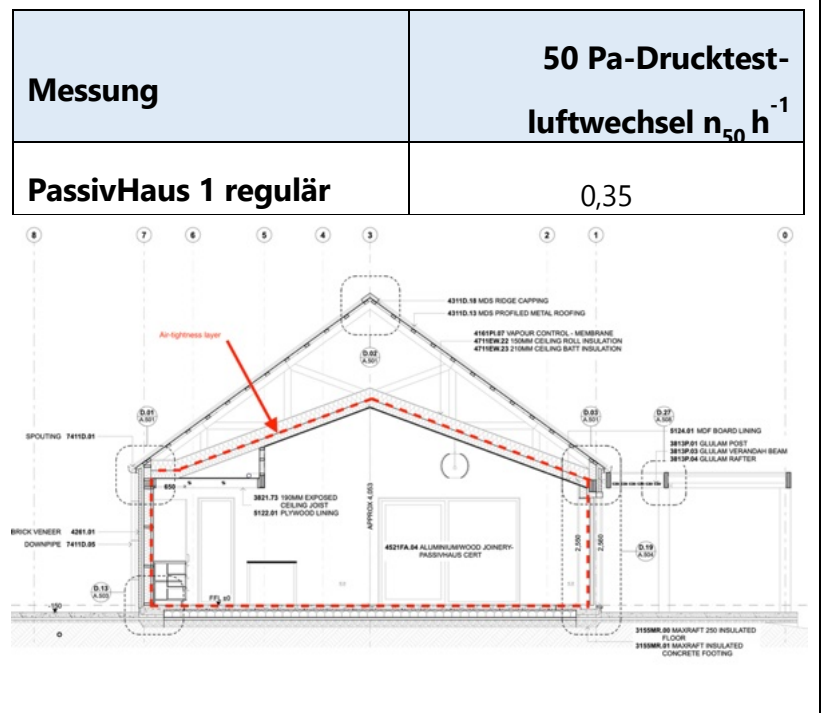
Product frame: Dopfner Holz 68mm frame, spruce (Uf 1.31)

Product glass (6mm/18/6mm/18/6mm): PlaniTherm XN Low-e, argon filled (Ug 0.64)

Window: Uw 1.06W/(m2K). g value = 51%

11. Beschreibung der luftdichten Hülle

The air-tight envelope is created by the continuous concrete slab on ground (no basement). The walls have a continuous internal layer of air-tight membrane (Intello) installed to the underside of the timber trusses and taped onto the continuous wall membrane creating a continuous system. The building form, and therefore the air-tightness membrane, was kept particularly simple so to meeting the PH air-tightness criteria.



Konzept Luftdichtheit

Wände: Intello membrane system

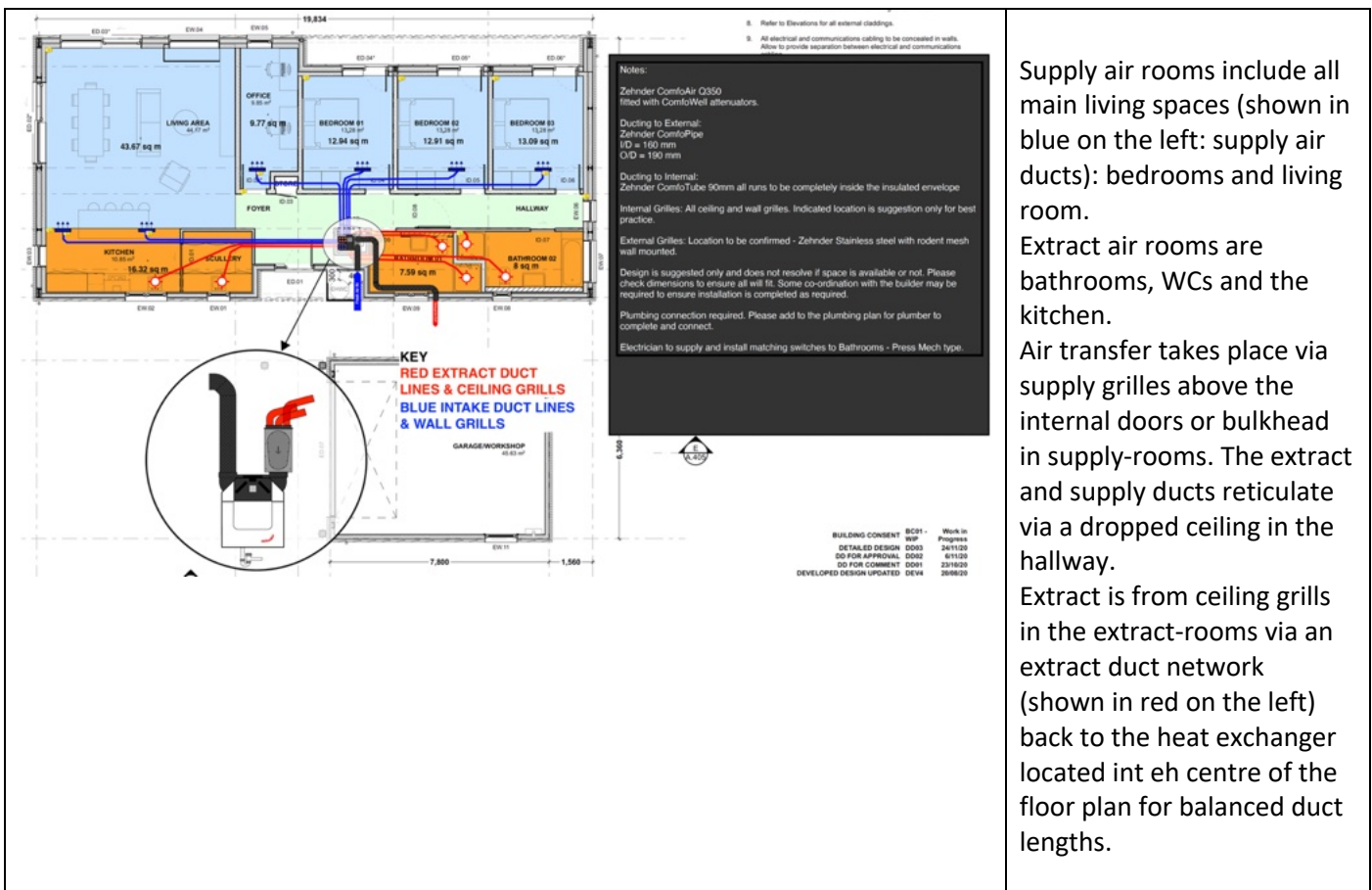
Bodenplatte: Concrete

Verbindung Fenster: Pro Clima tape system

Verbindung Putz-Folie: Intello air-tightness system



12. Lüftungsplanung Kanalnetz



Supply air rooms include all main living spaces (shown in blue on the left: supply air ducts): bedrooms and living room.

Extract air rooms are bathrooms, WCs and the kitchen.

Air transfer takes place via supply grilles above the internal doors or bulkhead in supply-rooms. The extract and supply ducts reticulate via a dropped ceiling in the hallway.

Extract is from ceiling grilles in the extract-rooms via an extract duct network (shown in red on the left) back to the heat exchanger located in the centre of the floor plan for balanced duct lengths.

13. Lüftungsgerät

The ventilation system is a Zehnder ComfoAir Q, with a Comfotube flexi-duct system. The HRVU unit is positioned in a cupboard situated centrally in the hallway. The ducts are distributed in the ceiling service cavity created. All ducts are inside the thermal & air-tightness envelope. Zehnder filters and outlets are used. The system was commissioned and balanced by the New Zealand Zehnder supplier and installer (Fantech NZ).



Fabrikat Lüftungsanlage	Zehnder ComfoAir Q350
effektiver Wärmebereitstellungsgrad	76 %
Electrical efficiency	0.29 Wh/m3

14. Wärmeversorgung


Mitsubishi air-source heat pump installed in living area for supplement heating and cooling. Not other heating required or installed.



The additional heating and cooling demand is provided by an air-source heat-pump wall mounted heater. This heating source is a manually operated unit that provides heating and cooling when required by the occupants. The unit has a 5kW cooling & 6.1kW heating output.

15. PHPP-Ergebnisse

Passive House Verification



Building: **Āhuru**

Street: _____

Postcode/City: _____

Province/Country: **Waikato** / **NZ-New Zealand**

Building type: **Single Residential**

Climate data set: **NZ0010a-Hamilton / Ruakura**

Climate zone: **4: Warm-temperate** Altitude of location: **52 m**

Home owner / Client:

Street: _____

Postcode/City: _____

Province/Country: _____ / **NZ-New Zealand**

Mechanical engineer: (Builder) Brown Construction

Street: **17B Perclo Place, Te Rapa**

Postcode/City: **3200 Hamilton**

Province/Country: _____ / **NZ-New Zealand**

Certification: Sustainable Engineering Ltd

Street: **65B Hungerford Road, Houghton Bay**

Postcode/City: **6023**

Province/Country: **Wellington** / **NZ-New Zealand**

Architecture: TAWA Architecture Ltd

Street: **31 Oliver Street**

Postcode/City: **3434 Cambridge**

Province/Country: **Waikato** / **NZ-New Zealand**

Energy consultancy: TAWA Architecture Ltd

Street: **31 Oliver Street**

Postcode/City: **3434 Cambridge**

Province/Country: **Waikato** / **NZ-New Zealand**

Year of construction: **2021**

No. of dwelling units: **1**

No. of occupants: **2.9**

Interior temperature winter [°C]: **20.0** Interior temp. summer [°C]: **25.0**

Internal heat gains (IHG) heating case [W/m²]: **2.4** IHG cooling case [W/m²]: **2.4**

Specific capacity [Wh/K per m² TFA]: **84** Mechanical cooling: _____


Specific building characteristics with reference to the treated floor area		Criteria	Alternative criteria	Fulfilled? ²
Space heating	Treated floor area m²	143.1		
	Heating demand kWh/(m²a)	14.6	≤ 15	yes
Heating load W/m²	12.2	≤ -	10	
Space cooling	Cooling & dehum. demand kWh/(m²a)	-	≤ -	-
	Cooling load W/m²	-	≤ -	-
	Frequency of overheating (> 25 °C) %	2.2	≤ 10	yes
	Frequency of excessively high humidity (> 12 g/kg) %	0.3	≤ 20	yes
Airtightness	Pressurization test result n ₅₀ 1/h	0.3	≤ 0.6	yes
Non-renewable Primary Energy (PE)	PE demand kWh/(m²a)	70.3	≤ -	-
Primary Energy Renewable (PER)	PER demand kWh/(m²a)	30.8	≤ 45	yes
	Generation of renewable energy (in relation to pro-jected building footprint area) kWh/(m²a)	74.3	≥ 60	


² Empty field: Data missing; '-': No requirement

I confirm that the values given herein have been determined following the PHPP methodology and based on the characteristic values of the building. The PHPP calculations are attached to this verification.

Task: _____ First name: **Jason** Surname: **Quinn**

Certificate ID: _____ Issued on: **19/04/24** City: **Wellington**

Passive House Plus? **yes**
 Signature: 



Year built: 2021

Treated floor area: 143.1m2

Enclosed volume: 479.2m3

Specific space heating demand: 14.6kWh/(m2a)

Heating load: 12.2W/m2

Pressurisation test result: 0.35h-1 (n50)

Specific primary energy demand: 70.3kWh/(m2a)

(DHW, heating, auxiliary electricity): 30.8kWh/(m2a)

Specific primary energy reduction through solar electricity: 74.3kWh/(m2a)

Frequency of overheating: 2% (over 25c)

Cooling load - Qk: 2kWh(m2a)

16. Baukosten

Building owner does not want to display this information.

17. Year of construction

2021-2022

18. Architecture

Brooke Cholmondeley-Smith – TAWA Architecture Ltd

Email: brooke@tawearch.co.nz

Mobile: 021 995 573

<https://www.tawearch.co.nz>

19. Building Services

Grant Robertson – Fantech Ltd

20. Building Physics & PH Certifier

Sustainable Engineering Ltd

21. Structural Engineering

JD Consulting Engineers Ltd

22. User Experience

The owner of the project is very pleased with the performance of the house, in particular the comfort and living experience.

23. Literatur

- https://passivehouse-database.org/index.php?lang=en#d_7954
- <https://www.tawearch.co.nz/kj72dqijlksokuy9gn88a0di8j892p>
- <https://ehaus.co.nz/project/ahuru/>
- <https://archipro.co.nz/project/ahuru-ehaus>

If you require any further information, please contact us:

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021 995 573

