Project Documentation
Gebäude-Dokumentation

Abstract | Zusammenfassung

Till Cottage

Data of building | Gebäudedaten

Year of construction Baujahr	2021	**Space heating** **Heizwärmebedarf**	**16** **kWh/(m²a)**
U-value external wall U-Wert Außenwand	0.214 W/(m²K)		
U-value basement U-Wert Kellerdecke	3.061 W/(m²K)	Primary Energy Renewable (PER) Erneuerbare Primärenergie (PER)	49 kWh/(m²a)
U-value roof U-Wert Dach	0.132 W/(m²K)	Generation of renewable Energy Erzeugung erneuerb. Energie	0 kWh/(m²a)
U-value window U-Wert Fenster	1.40 W/(m²K)	Non-renewable Primary Energy (PE) Nicht erneuerbare Primärenergie (PE)	115 kWh/(m²a)
Heat recovery Wärmerückgewinnung	81%	Pressurization test n_{50} Drucktest n_{50}	0.6 h^{-1}
Special features Besonderheiten	Retrofit to Passive House Standard/ Nachrüstung auf Passivhaus-Standard		

Brief Description

Till Cottage

Originally built in 2008, Energy Architecture was invited to retrofit this home in a close-knit community development. The target for the retrofit was Passive House certification, a challenging and unique aspiration for a retrofit project. Woodfibre insulation was used to improve the U-value of the walls and a roof, a novel building material in New Zealand despite our forestry resources.

Kurzbeschreibung

Till Hütte

Ursprünglich im Jahr 2008 erbaut, wurde Energy Architecture eingeladen, dieses Haus in einer engmaschigen Gemeinschaftsentwicklung nachzurüsten. Das Ziel für die Sanierung war die Passivhaus-Zertifizierung, ein herausfordernder und einzigartiger Anspruch für ein Sanierungsprojekt. Um den U-Wert der Wände und eines Daches zu verbessern, wurde eine Holzfaserdämmung verwendet, ein neuartiges Baumaterial in Neuseeland trotz unserer forstwirtschaftlichen Ressourcen.

Responsible project participants
Verantwortliche Projektbeteiligte

Architect Entwurfsverfasser	Energy Architecture https://www.energyarchitecture.nz/
Implementation planning Ausführungsplanung	N/A
Building systems Haustechnik	N/A
Structural engineering Baustatik	Groove Design http://groovedesign.co/
Building physics Bauphysik	Energy Architecture https://www.energyarchitecture.nz/
Passive House project planning Passivhaus-Projektierung	N/A
Builder Bauleitung	Till Sclimme

Certifying body
Zertifizierungsstelle

Sustainable Engineering Ltd
www.sustainableengineering.co.nz

Certification ID
Zertifizierungs ID

[ID: 7186]	Project-ID (www.passivehouse-database.org) Projekt-ID (www.passivhausprojekte.de)

Author of project documentation
Verfasser der Gebäude-Dokumentation

Energy Architecture (Guy Shaw)
https://www.energyarchitecture.nz/

Date Datum	Signature Unterschrift
05/04/2023	

1. Exterior photos - Ansichtsfotos

North & East Elevations / Nord- und Ostansichten

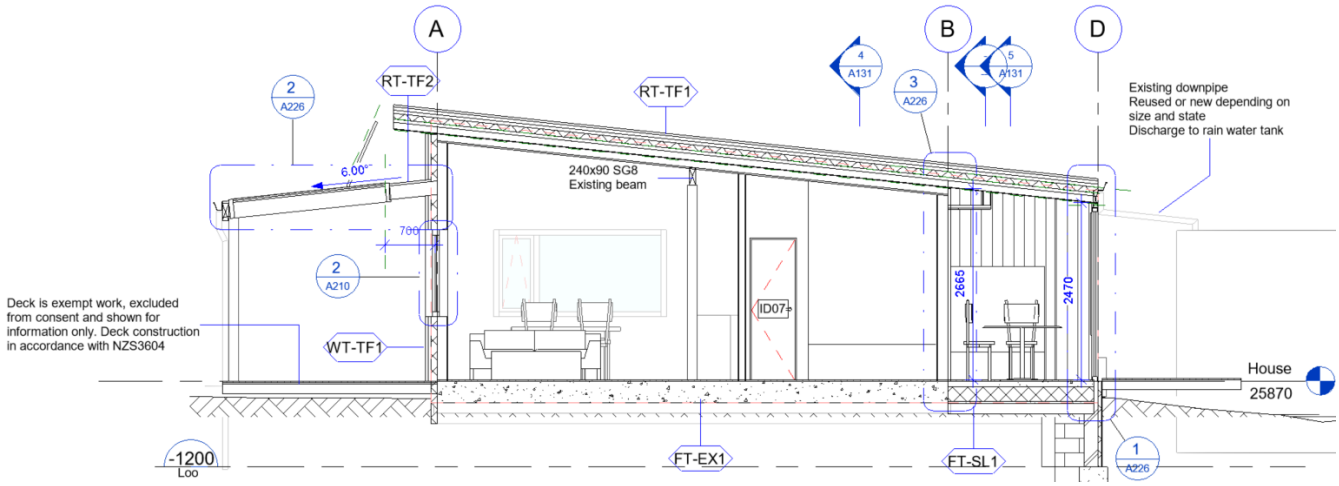
South & West Elevations / Süd- und Westansichten.

2. Interior photos - Innenfoto exemplarisch

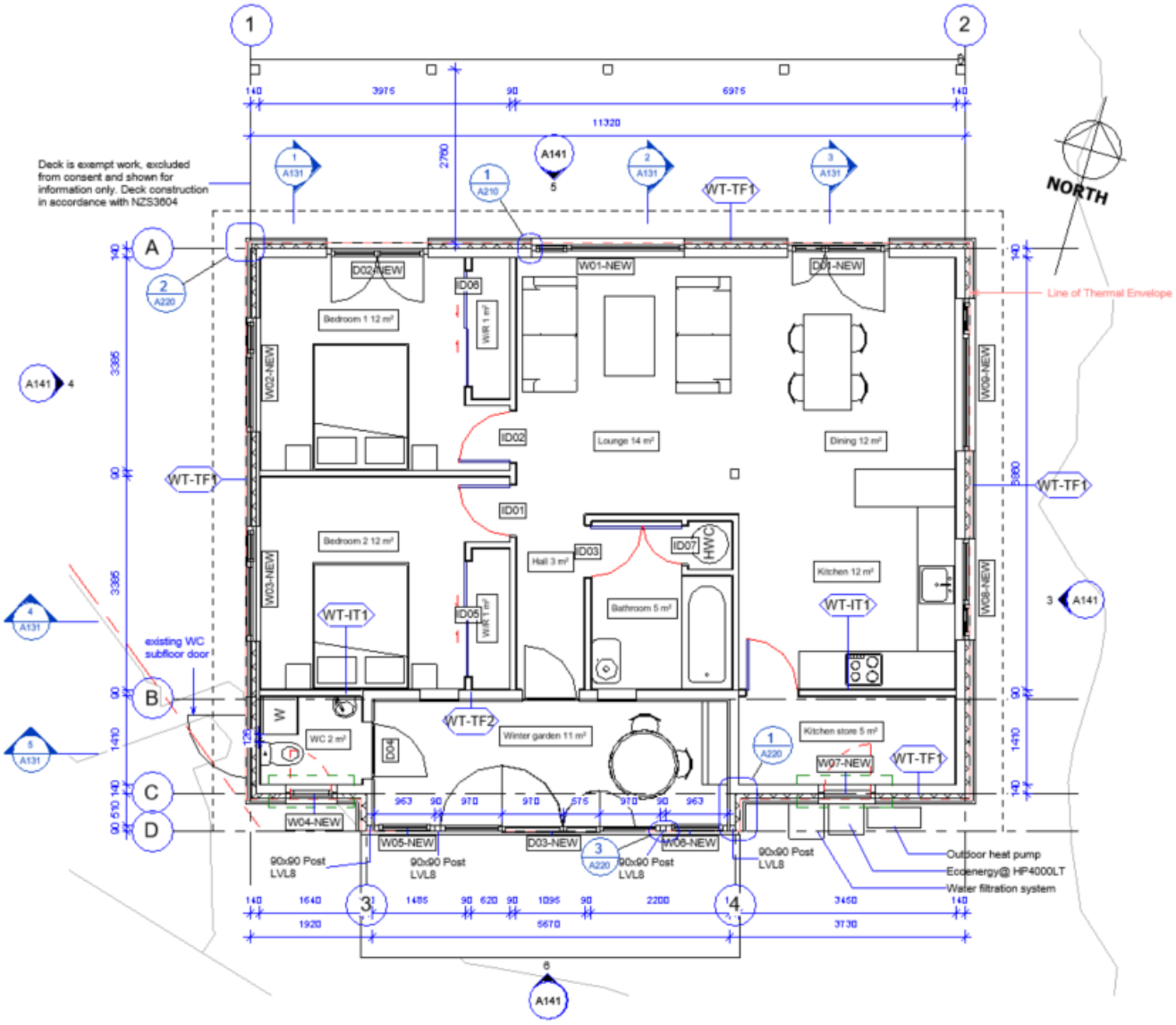
Kitchen/ Küche

Bedroom/ Schlafzimmer

3. Sections - Schnittzeichnung



4. Floor plans - Grundrisse



5. Floor slab/ basement ceiling construction including insulation
Konstruktion der Bodenplatte

New rendered perimeter ESP insulation to existing concrete waffle slab.

Neue verputzte Perimeter-ESP-Dämmung an bestehender Betonwaffelplatte.

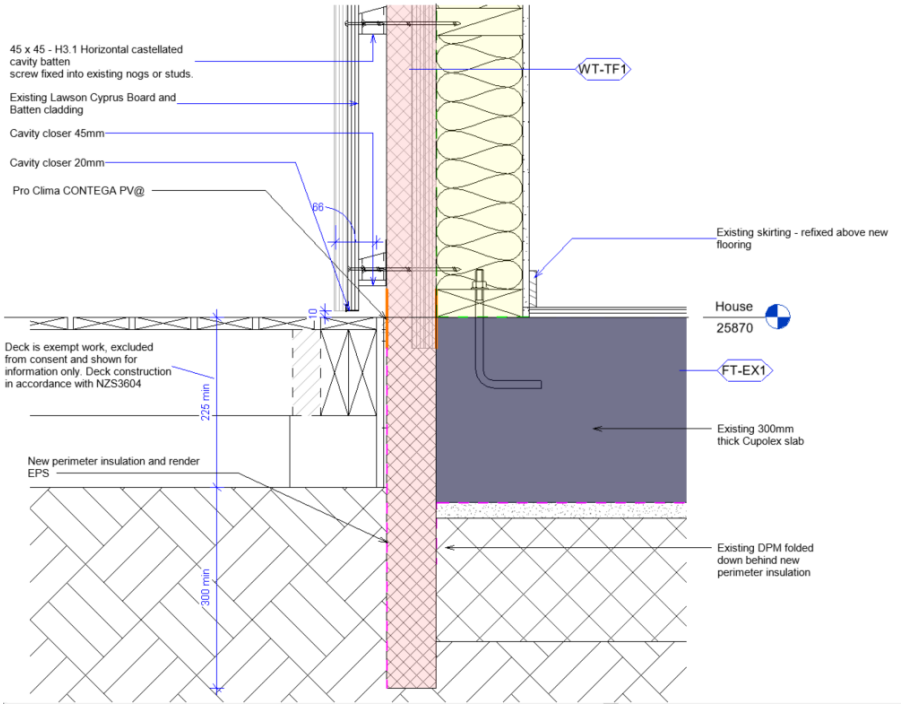


Photo:top edge of slab edge insulation prior to external insulation install.

Foto: Oberkante Deckenkante Isolierung vor externen Isolierung installieren.

Assembly no. 03ud — Slab

Interior insulation?

Heat transmission resistance [m²K/W]

Orientation of building element: 3-Floor — interior R_{si}: 0.13

Adjacent to: 2-Ground — exterior R_{se}: 0.00

Area section 1	λ [W/(mK)]	Area section 2 (optional)	λ [W/(mK)]	Area section 3 (optional)	λ [W/(mK)]	Thickness [mm]
Concrete	2.100					100
Concrete	2.100	Cupolex	0.670			150

Percentage of sec. 1: 30% — Percentage of sec. 2: 70.0% — Percentage of sec. 3:

Total: 25.0 cm

U-value supplement: W/(m²K)

U-value: 3.061 W/(m²K)

6. Wall construction including insulation - Konstruktion der Außenwände

New retrofit airtightness membrane and wood fibre external insulation over existing 140 thick insulated timber framed wall. Existing timber cladding installed over new drained cavity.

Neue nachrüstbare Luftdichtheitsmembran und Holzfaser-Außendämmung über bestehender 140 dicker isolierter Holzrahmenwand. Vorhandene Holzverkleidung über neuem entwässertem Hohlraum installiert

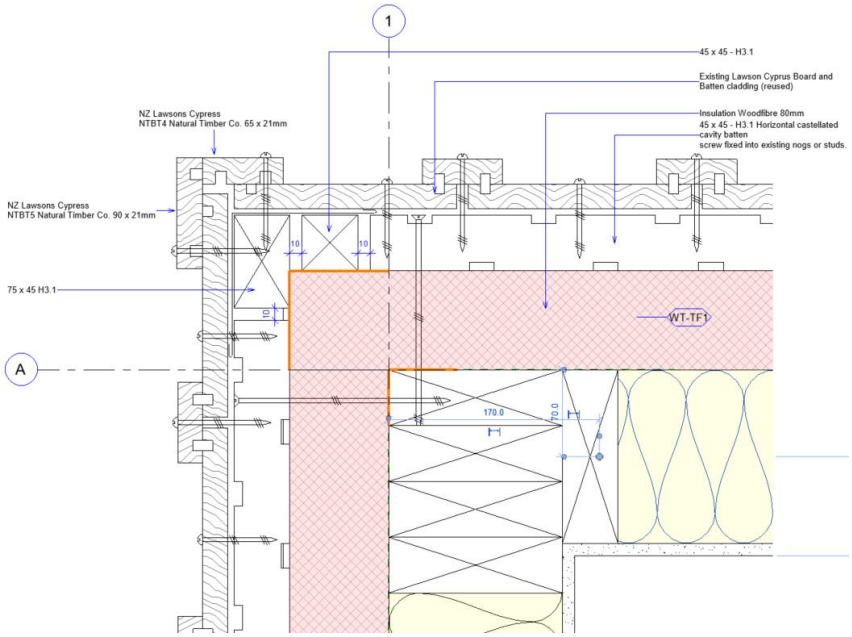


Photo: Existing timber framed wall with retrofit airtightness membrane and external wood fibre insulation layers in progress.

Foto: Bestehende Holzrahmenwand mit nachträglicher Luftdichtheitsbahn und außenliegenden Holzfaserdämmschichten in Bearbeitung.

Assembly no.	Building assembly description					Interior insulation?
01ud	Wall					

Heat transmission resistance [m²K/W]

Orientation of building element: 2-Wall — interior R_{si}: 0.13

Adjacent to: 3-Ventilated — 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]
Gutex cont	0.040					80
WoolpolyTerraLanaWall R3.2@140mm	0.044	Timber	0.130			140
GIB	0.250					10

Percentage of sec. 1	Percentage of sec. 2	Percentage of sec. 3	Total
69%	22.0%	9.0%	23.0 cm

U-value supplement: 0.0000258 W/(m²K)

U-value: 0.214 W/(m²K)

7. Roof construction including insulation - Konstruktion des Daches

New retrofit airtightness membrane and wood fibre external insulation over existing 240 thick insulated timber framed roof. New drained and vented roof cladding. Existing eaves and veranda members tape sealed where penetrating new airtightness membrane.

Neue nachrüstbare Luftdichtheitsmembran und Holzfaser-Außendämmung über dem bestehenden 240 dicken isolierten Holzrahmendach. Neue entwässerte und belüftete Dacheindeckung. Vorhandene Traufen und Verandaelemente werden dort mit Klebeband abgedichtet, wo neue Luftdichtheitsmembranen durchdringen.

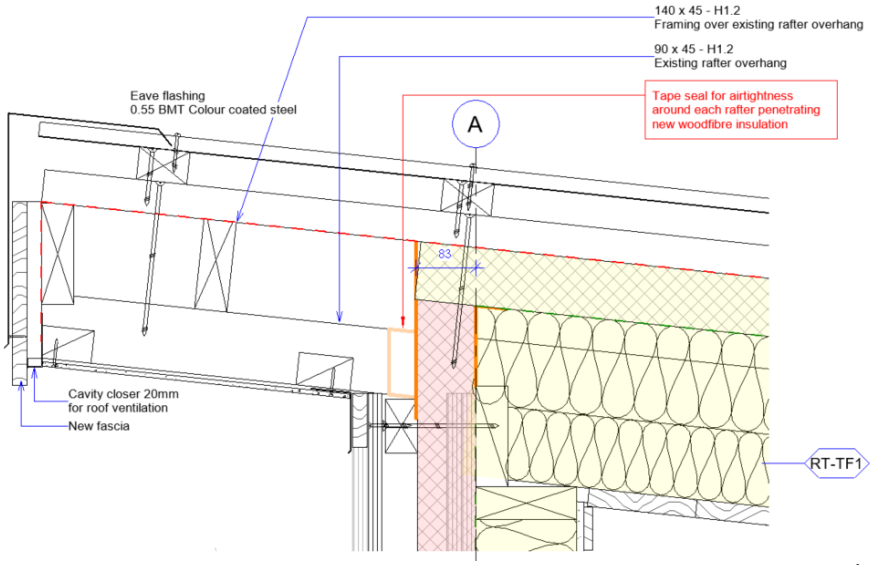


Photo:Retrofit airtightness membrane and external wood fibre insulation layers in progress on roof.

Foto: Nachrüstung Luftdichtheitsbahn und äußere Holzfaserdämmschichten am Dach in Arbeit.

Assembly no.						Interior insulation?
02ud	Roof - vented					

Heat transmission resistance [m²K/W]

Orientation of building element: 1-Roof — interior R_{si}: 0.13

Adjacent to: 3-Ventilated — 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]
Gutex	0.040					80
WoolpolyTerraLanaCeilingR0.9@35mm	0.038	Timber	0.130			65
WoolpolyTerraLanaCeilingR4.0@165mm	0.041	Timber	0.130			165
Sarking	0.130					20

Percentage of sec. 1	Percentage of sec. 2	Percentage of sec. 3	Total
85%	6.0%	9.0%	33.0 cm

U-value supplement: 0.00 W/(m²K)

U-value: 0.132 W/(m²K)

8. Window and window installation including glass Ug / g-value and frame perfromance - Fenster und Fenster-Einbau

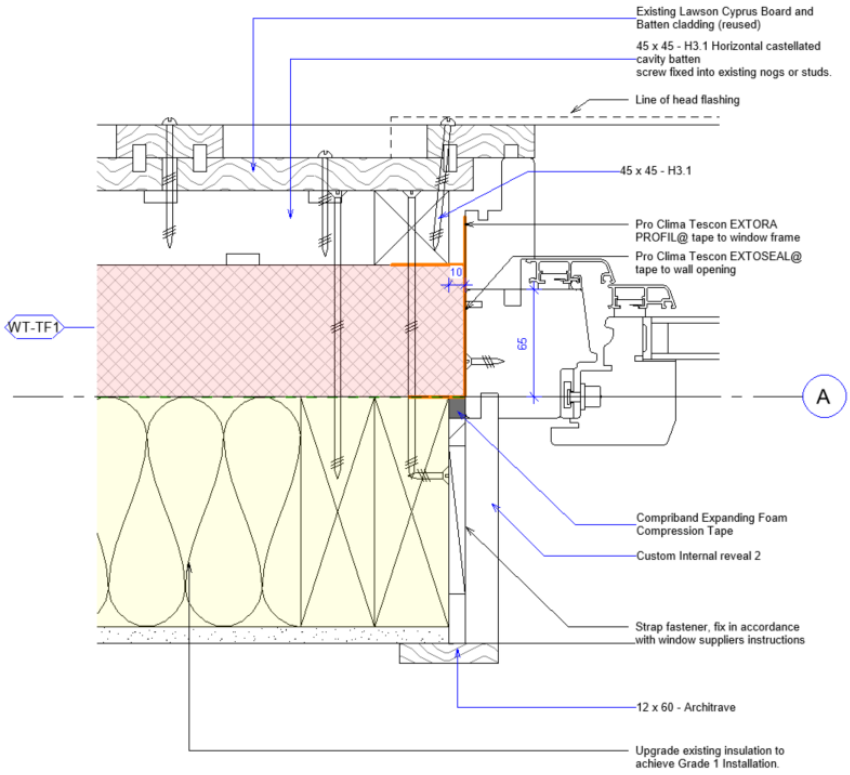


Photo: Window installation prior to fitting of external wood fibre insulation.

Foto: Fenstereinbau vor Anbringen der Holzfaser-Außendämmung

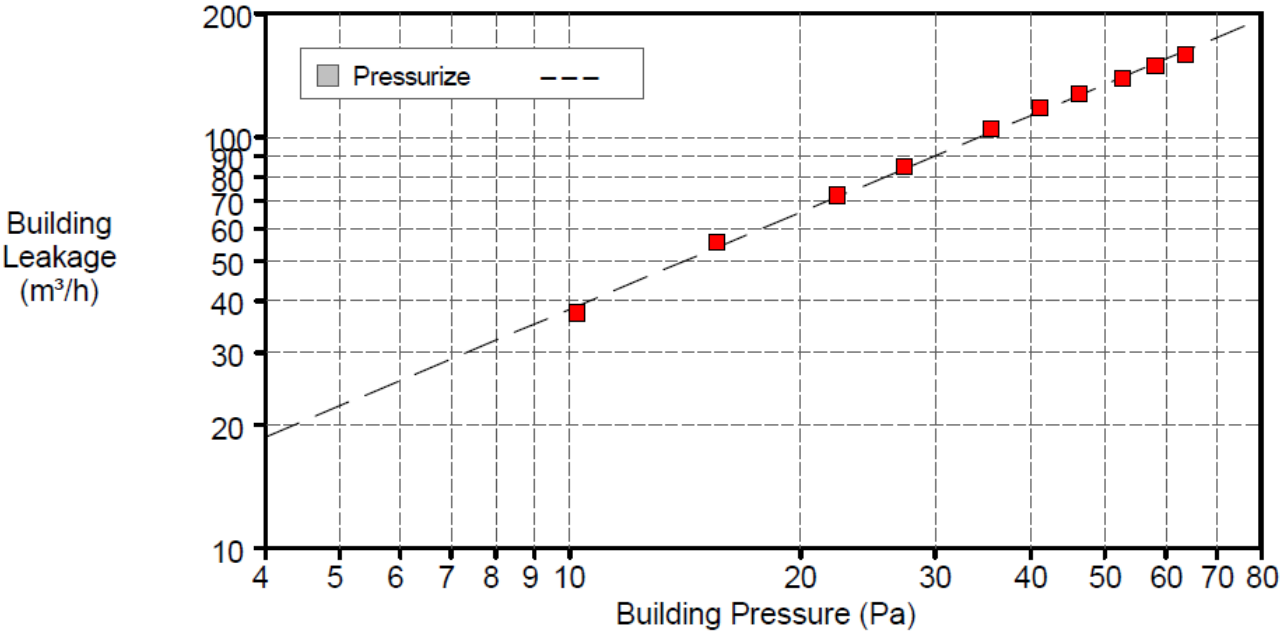
Description of window (frame) construction Beschreibung der Fenster (rahmen)-Konstruktion	aluminium clad timber frame Aluminium verkleideter Holzrahmen
Make of window (frame; product name) Fabrikat Fenster (rahmen; Produktname)	Thermadura Designline 78 in Larch
Frame U value Uf Rahmen-U-Wert Uf	1.34 W/(m²K)
type of glazing Bauart der Verglasung	Low-E double 4-18-4 Argon
Glass U- value Ug Glas-U-Wert Ug	1.14 W/(m²K)
g-value of the glazing g-Wert der Verglasung	0.64
Glass Spacer Abstandshalter aus Glas	Swiss spacer ultimate

9. Air leakage testing - Beschreibung der luftdichten Hülle

Photo: Existing timber framed wall with retrofit airtightness membrane in progress.
Foto: Bestehende Holzrahmenwand mit nachgerüsteter Luftdichtheitsmembran in Bearbeitung.

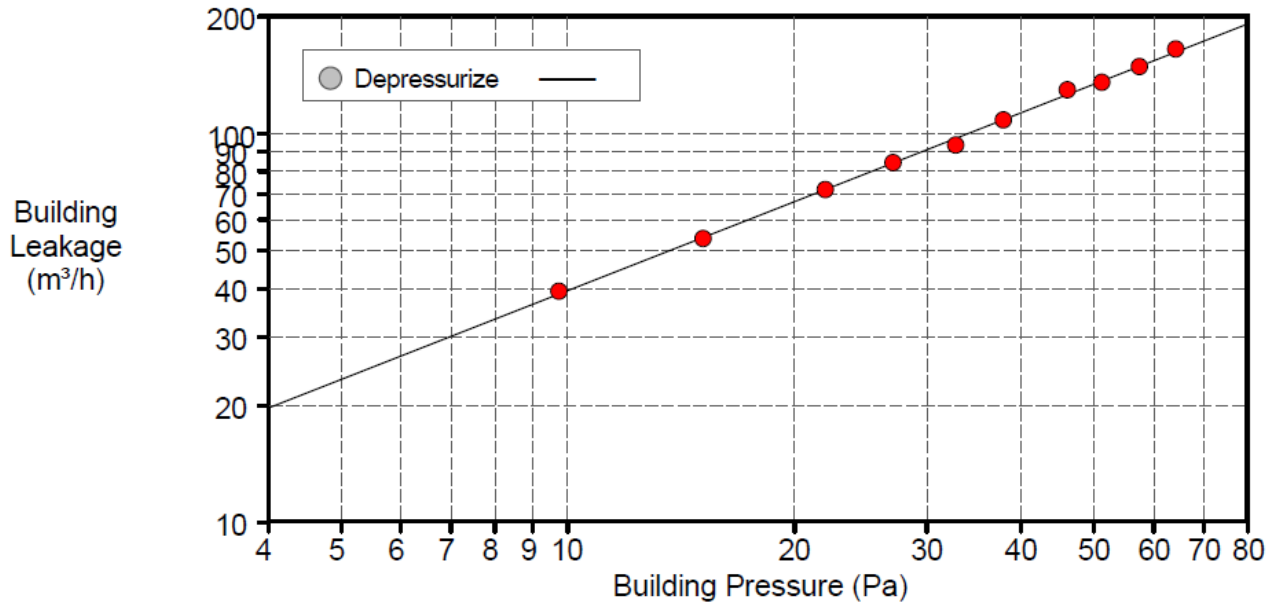
Photo: Blower door testing in progress.
Foto: Blower-Door-Test läuft.

Description of airtightness strategy Beschreibung der Luftdichtheitsstrategie	
Roof	ProClima Dasatop over existing rafters and under Gutex external insulation ProClima Dasatop auf vorhandenen Sparren und unter Gutex-Außendämmung
Walls	ProClima Dasatop over existing studs and under Gutex external insulation ProClima Dasatop über vorhandenen Ständern und unter Gutex-Außendämmung
Floor	Existing Concrete slab Vorhandene Betonplatte
Windows	Tape seal from window frame (exterior side) to ProClima Dasatop over existing studs Dichtung vom Fensterrahmen (Aussenseite) zu ProClima Dasatop über vorhandene Stollen abkleben
n50 air change rate n50 Luftwechselrate	0.525
Test performed by: Test durchgeführt von:	Dave Firth - REVEAL BUILDING CONSULTANTS LIMITED 31.10.2022



Test Results at 50 Pascals:

q_{50} :	m³/h (Airflow)	135 (+/- 2.0 %)
n_{50} :	1/h (Air Change Rate)	0.53
q_{F50} :	m³/(h·m² Floor Area)	1.49
q_{E50} :	m³/(h·m² Envelope Area)	0.40



Test Results at 50 Pascals:

q_{50} :	m³/h (Airflow)	134 (+/- 1.9 %)
n_{50} :	1/h (Air Change Rate)	0.52
q_{F50} :	m³/(h·m² Floor Area)	1.49
q_{E50} :	m³/(h·m² Envelope Area)	0.40

10. MVHR - Lüftungsgerät

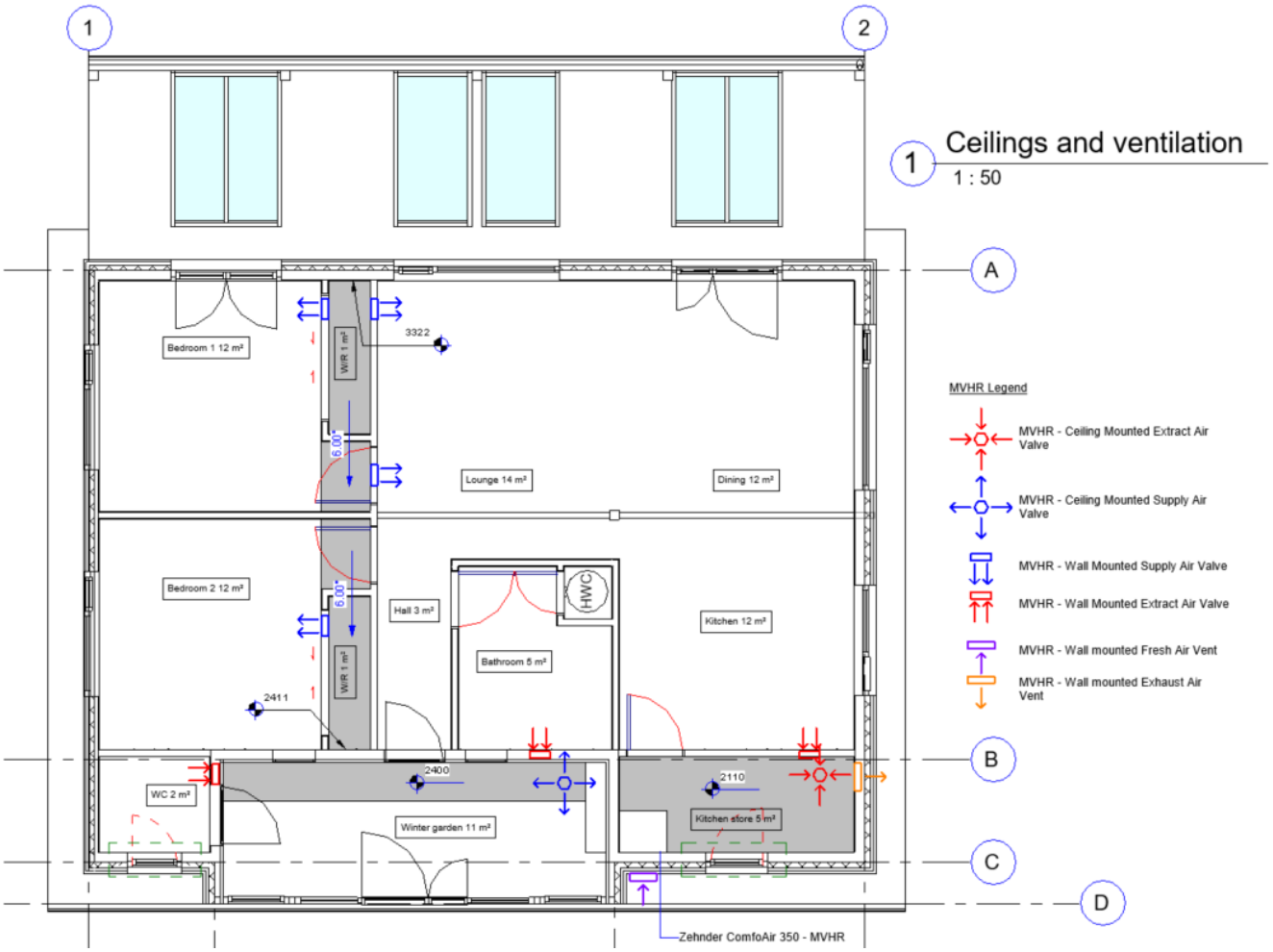
Photo: MVHR unit in store by kitchen
Foto: MVHR-Einheit im Geschäft neben der Küche

Description of ventilation system Beschreibung des Lüftungssystems	Mechanical ventilation with heat recovery Mechanische Lüftung mit Wärmerückgewinnung
Make of unit Fabrikat der Einheit	Zehnder ComfoAir Q350
Heat recovery rate Wärmebereitstellungsgrad	91%
Specific electric power Spezifische elektrische Leistungsaufnahme	0.24 Wh/m3

11. Ventilation ductwork - Lüftungsplanung Kanalnetz

MVHR unit located in kitchen store. Ducting routes formed using existing cupboards and new bulkheads. Supply air into bedrooms, living room and wintergarden. Extract from WC, Kitchen, Bathroom and Kitchen store. The hallway is the transfer zone and door undercuts are used to facilitate air transfer.

MVHR-Einheit im Küchengeschäft. Kanalrouten, die unter Verwendung bestehender Schränke und neuer Schotten gebildet wurden. Zuluft in Schlafzimmer, Wohnzimmer und Wintergarten. Auszug aus dem WC-, Küchen-, Bad- und Küchenlager. Der Flur ist die Transferzone und Türunterschnitte werden verwendet, um den Lufttransfer zu erleichtern.



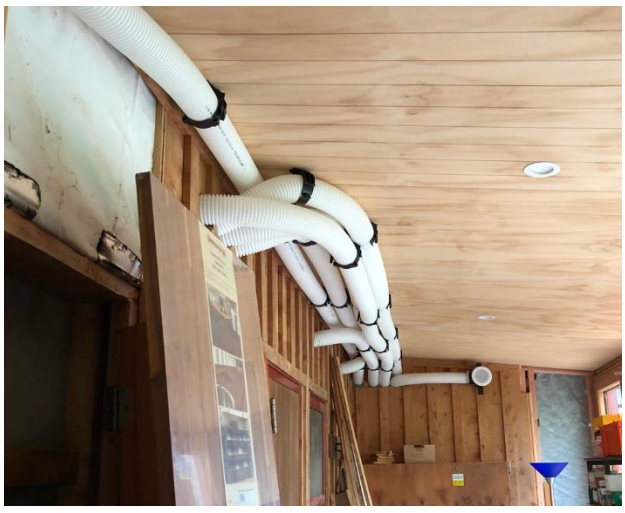


Photo: Formation of ducting route through wintergarden

Foto: Trassenführung durch den Wintergarten

12. Heating systems - Wärmeversorgung

Daiken Split Heat pump unit (indoor and outdoor components indicated in photos below) / Daiken Split-Wärmepumpeneinheit (Innen- und Außenkomponenten in den Fotos unten angegeben)

13. Building costs - Baukosten

- N/A

14. Publications featuring the building - Literatur

- N/A

15. PHPP-Ergebnisse

Passive House Verification

Building:	Till Cottage		
Street:			
Postcode/City:		Kaiwaka	
Province/Country:	Kaiwaka	NZ-New Zealand	
Building type:	Single detached dwelling		
Climate data set:	ud---01-NZ0018a-Kaitaia		
Climate zone:	5: Warm	Altitude of location:	30 m
Home owner / Client:	Till Schlimme		
Street:			
Postcode/City:		Kaiwaka	
Province/Country:	Kaiwaka	NZ-New Zealand	

Architecture:	Energy Architecture NZ Ltd		
Street:	28 Hopper St, Mt Cook		
Postcode/City:	6011	Wellington	
Province/Country:		NZ-New Zealand	
Energy consultancy:	Energy Architecture NZ Ltd		
Street:	28 Hopper St, Mt Cook		
Postcode/City:	6011	Wellington	
Province/Country:		NZ-New Zealand	
Mechanical engineer:	(Builder) Till Schlimme		
Street:	364 Oneriri Rd		
Postcode/City:	0573	Kaiwaka	
Province/Country:	Kaiwaka	NZ-New Zealand	
Certification:	Sustainable Engineering Ltd		
Street:	65B Hungerford Rd, Houghton Bay		
Postcode/City:	6023	Wellington	
Province/Country:		NZ-New Zealand	

Year of construction:	2021	Interior temperature winter [°C]:	20.0	Interior temp. summer [°C]:	25.0
No. of dwelling units:	1	Internal heat gains (IHG) heating case [W/m²]:	2.7	IHG cooling case [W/m²]:	4.1
No. of occupants:	2.2	Specific capacity [Wh/K per m² TFA]:	60	Mechanical cooling:	x

Specific building characteristics with reference to the treated floor area

					Criteria	Alternative criteria	Fullfilled?[2]
	Treated floor area	m²	90.6				
Space heating	Heating demand	kWh/(m²a)	15.85	≤	15	-	yes
	Heating load	W/m²	9.86	≤	-	10	
Space cooling	Cooling & dehum. demand	kWh/(m²a)	9.53	≤	19	19	yes
	Cooling load	W/m²	6.61	≤	-	11	
	Frequency of overheating (> 25 °C)	%	-	≤	-		-
	Frequency of excessively high humidity (> 12 g/kg)	%	0	≤	10		yes
Airtightness	Pressurization test result n_{50}	1/h	0.6	≤	0.6		yes
Non-renewable Primary Energy (PE)	PE demand	kWh/(m²a)	115	≤	-		-
Primary Energy Renewable (PER)	PER demand	kWh/(m²a)	49	≤	60	60	yes
	Generation of renewable energy (in relation to projected building footprint area)	kWh/(m²a)	0	≥	-	-	

[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.

Passive House Classic? yes

Task:	First name:	Surname:	Signature:
2-Certifier	Jason	Quinn	

Certificate ID	Issued on:	City:
38239_SENZ_PH_20230323_JEQ	23/03/23	Wellington

Project data imported from designPH 2.0.06 PHPP9 display.code: