Project Documentation
Gebäude-Dokumentation

Abstract | Zusammenfassung

Betances Residence, 445 East 142nd Street, Bronx, NY

Data of building | Gebäudedaten

Year of construction Baujahr	2019	**Space heating** **Heizwärmebedarf**	**9** **kWh/(m²a)**
U-value external wall U-Wert Außenwand	0.196 W/(m²K)		
U-value basement U-Wert Kellerdecke	0.294 W/(m²K)	Primary Energy Renewable (PER) Erneuerbare Primärenergie (PER)	87 kWh/(m²a)
U-value roof U-Wert Dach	0.091 W/(m²K)	Generation of renewable Energy Erzeugung erneuerb. Energie	See below
U-value window U-Wert Fenster	1.04 W/(m²K)	Non-renewable Primary Energy (PE) Nicht erneuerbare Primärenergie (PE)	119 kWh/(m²a)
Heat recovery Wärmerückgewinnung	84 %	Pressurization test n_{50} Drucktest n_{50}	0.5 h^{-1}
Special features Besonderheiten	The ground floor is mixed use with healthcare offices, community room, library, computer room, fitness center, kindergarten and private outdoor space. The rooftop includes a photovoltaic array producing 35,417 kWh/yr.		

Betances Residence

Betances was developed by Breaking Ground, New York's largest provider of street outreach and supportive housing. It is the group's first Passive House residence, which will house and support homeless and low income seniors. The building is located between East 142nd Street and East 143rd Street in the Mott Haven neighborhood of the Bronx in New York City. The 8 story, 152-unit residence will dedicate 25% of units to New York City Housing Authority (NYCHA) seniors, 45 units to homeless seniors, and remaining units to seniors with incomes of less than 50% of the area median income.

The project includes active design principles, outdoor garden spaces, accessible accommodations, as well as Social Services support to refer tenants to medical care. The building is organized into two residential towers, with a variety of shared spaces at the ground floor connecting the two towers that promote mental and physical well-being, independence and social connectedness for the residents. These shared spaces and services include: on-site medical and psychiatric care, a garden, a library, a multi-purpose room, a computer room, a fitness room, bicycle storage and laundry as well as a separate Community Facility for a community-based non-profit tenant.

The design and construction of Betances V provides a superior living environment for residents. The high mass construction, continuous thermal envelope, and high-performance windows significantly reduces noise from outdoors. This translates to a quieter, more peaceful apartment setting. In addition, the thermal envelope and windows, coupled with the heating/cooling system allows residents to set and maintain their own consistent, comfortable temperature. Cold-surfaces and drafts have been eliminated with high-performance windows and thorough air-sealing and compartmentalization. The ERVs deliver a continuous flow of fresh, filtered air from outdoors and remove stale air from each apartment, resulting in excellent indoor air quality.

Responsible project participants | Verantwortliche Projektbeteiligte

Architect Entwurfsverfasser	COOKFOX Architects 250 W 57th St 10107 New York , United States of America
Client	BREAKING GROUND 505 8th Ave 10018 New York, United States of America
Building systems Haustechnik	DAGHER ENGINEERING 29 Broadway 10006 New York, United States of America
Structural engineering Baustatik	WSP 1 Pennsylvania Plaza New York, NY 10119, United States of America
Building physics Bauphysik	STEVEN WINTER ASSOCIATES 307 Seventh Avenue New York, NY 10001, United States of America
Passive House project planning Passivhaus-Projektierung	STEVEN WINTER ASSOCIATES 307 Seventh Avenue New York, NY 10001, United States of America
Construction management Bauleitung	MONADNOCK CONSTRUCTION 155 3rd St Brooklyn, NY 11231, United States of America

Certifying body
Zertifizierungsstelle

PASSIVE HOUSE ACADEMY
334 Douglass, Brooklyn, NY 11217, United States of America

Certification ID
Zertifizierungs ID

6336	Project-ID (www.passivehouse-database.org) Projekt-ID (www.passivhausprojekte.de)

Author of project documentation
Verfasser der Gebäude-Dokumentation

Thomas Moore
STEVEN WINTER ASSOCIATES

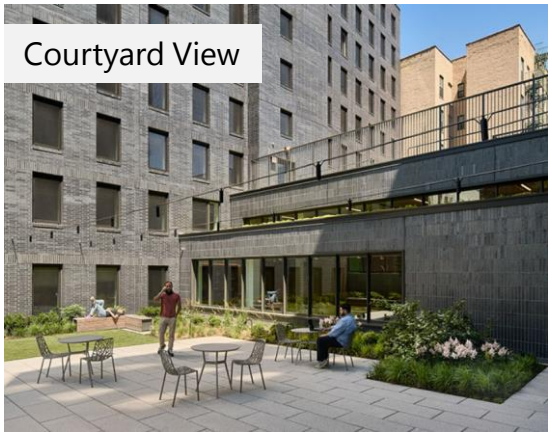
Date Datum	Signature Unterschrift
15.07.2022	

1. Exterior Photos | Ansichtsfotos

Street View

Entry View

Courtyard View



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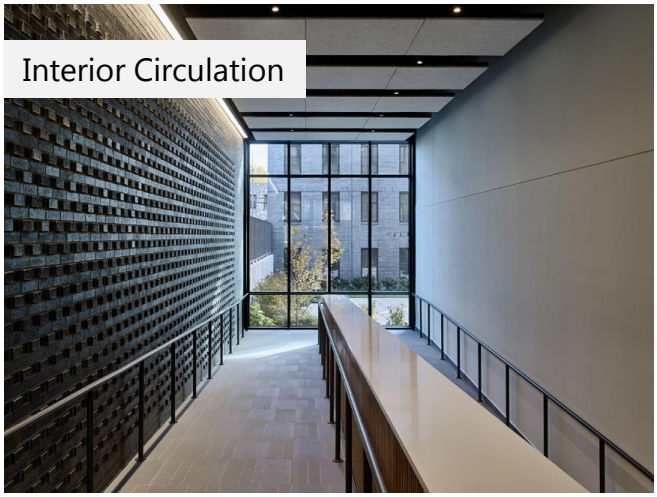
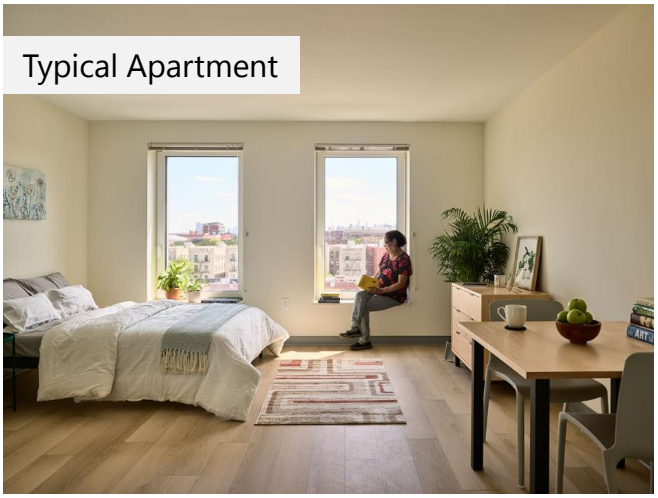
2. Interior Photos | Innenfoto exemplarisch

Interior Circulation



Typical Apartment



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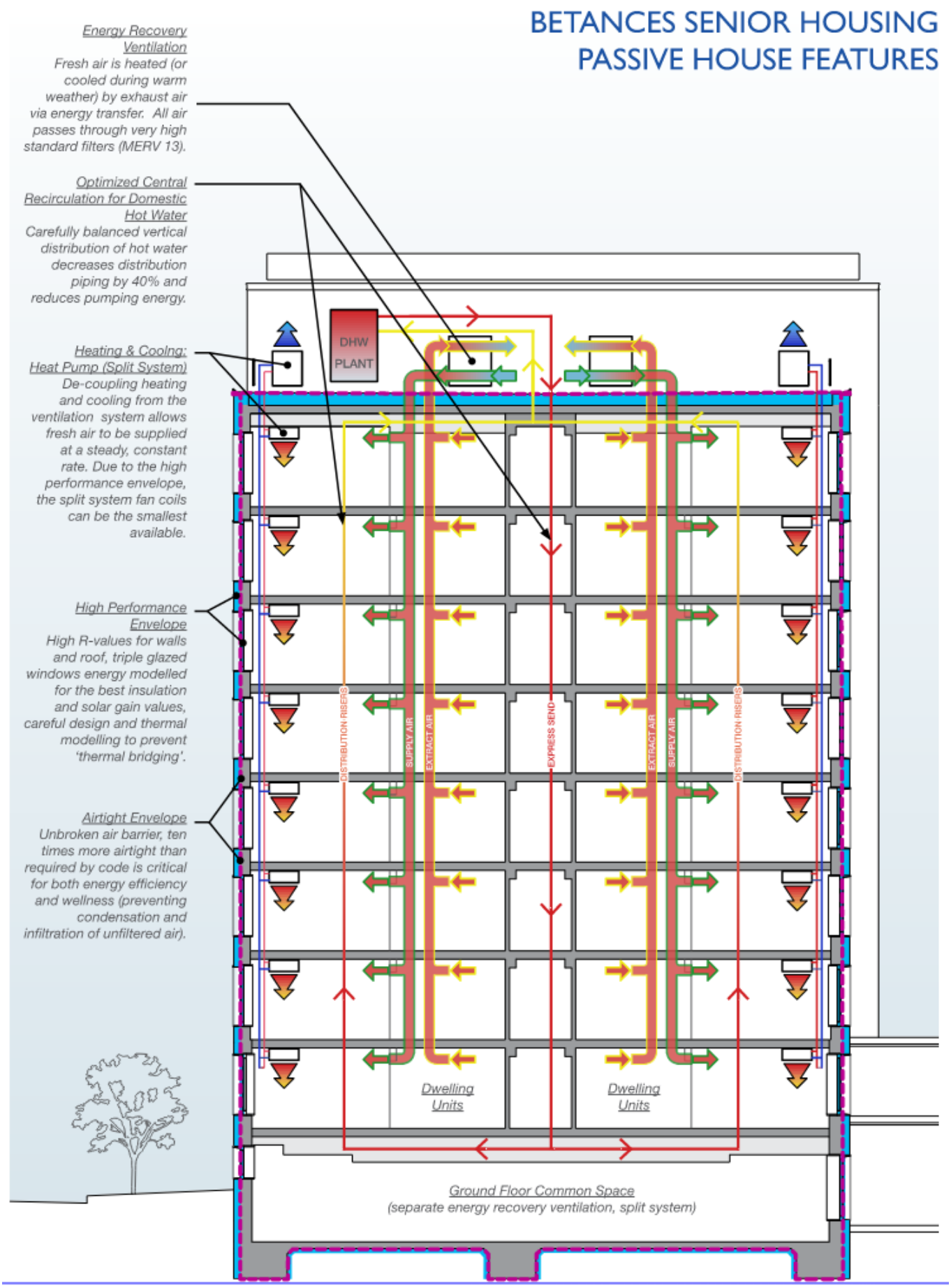
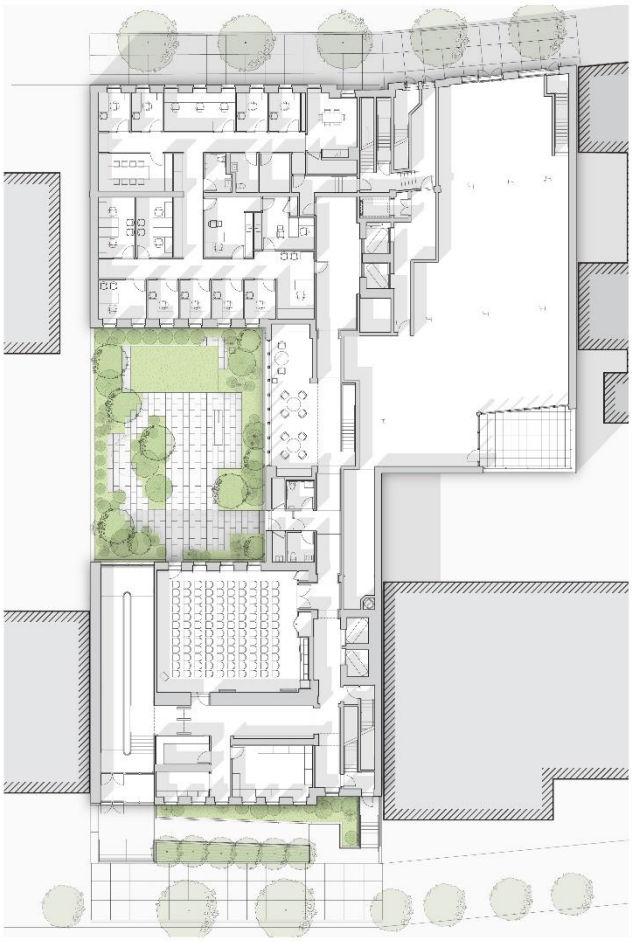
3. Building Sections | Schnittzeichnung

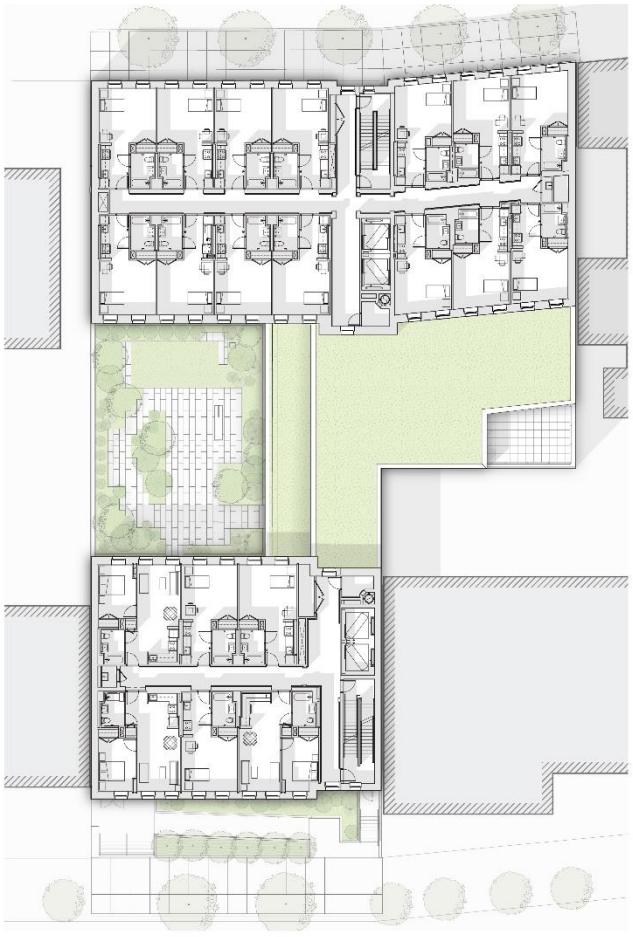


4. Floor Plans | Grundrisse

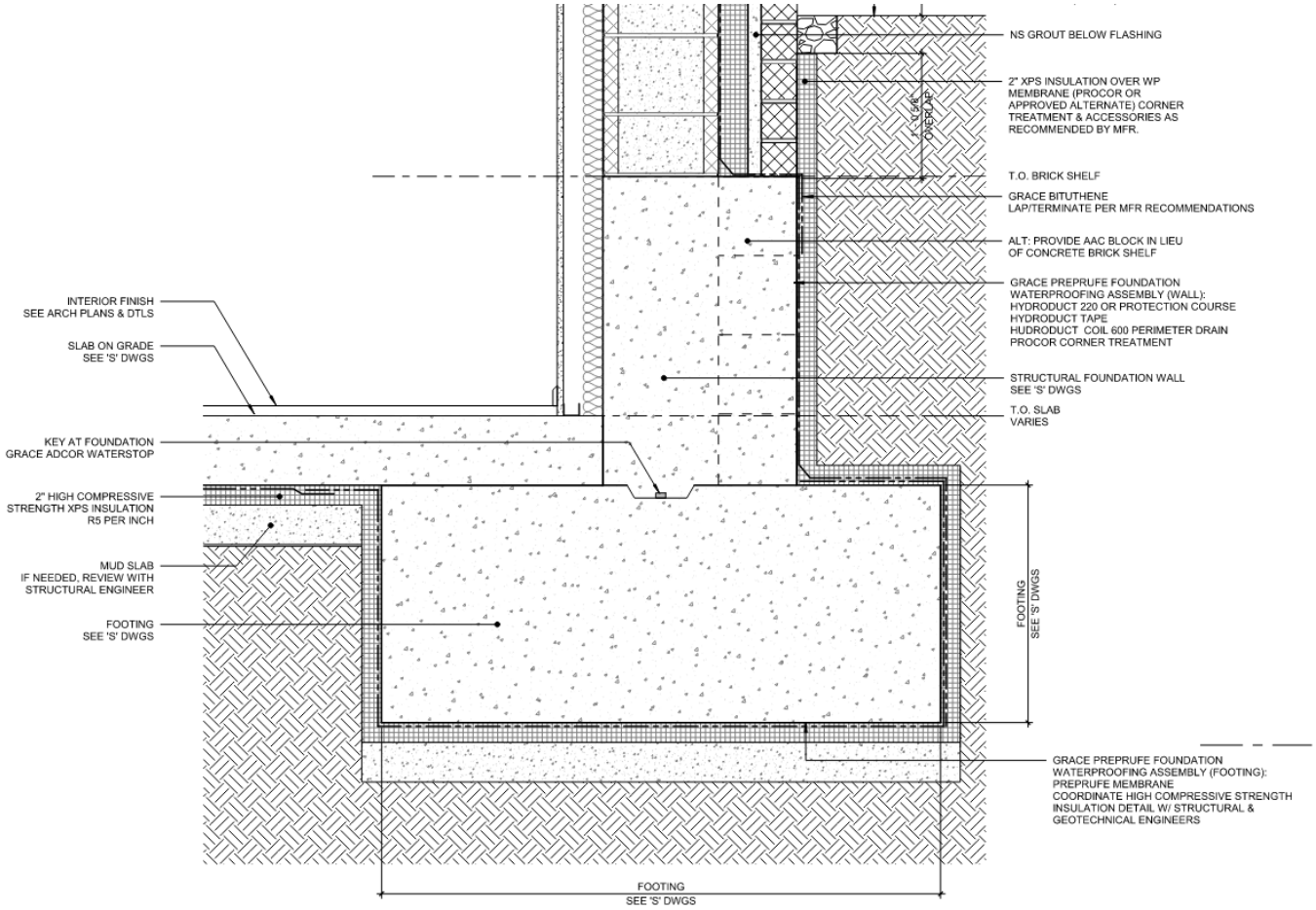
First Floor Plan



Typical Floor Plan



5. Floor Construction | Konstruktion der Bodenplatte



TYPICAL WALL BASE AT FOOTING

NOT TO SCALE

Assembly no.	Building assembly description					Interior insulation?
04ud	Slab					

Heat transmission resistance [m²K/W]

Orientation of building element: 3-Floor — interior Rsi: 0.13

Adjacent to: 2-Ground — exterior Rse: 0.00

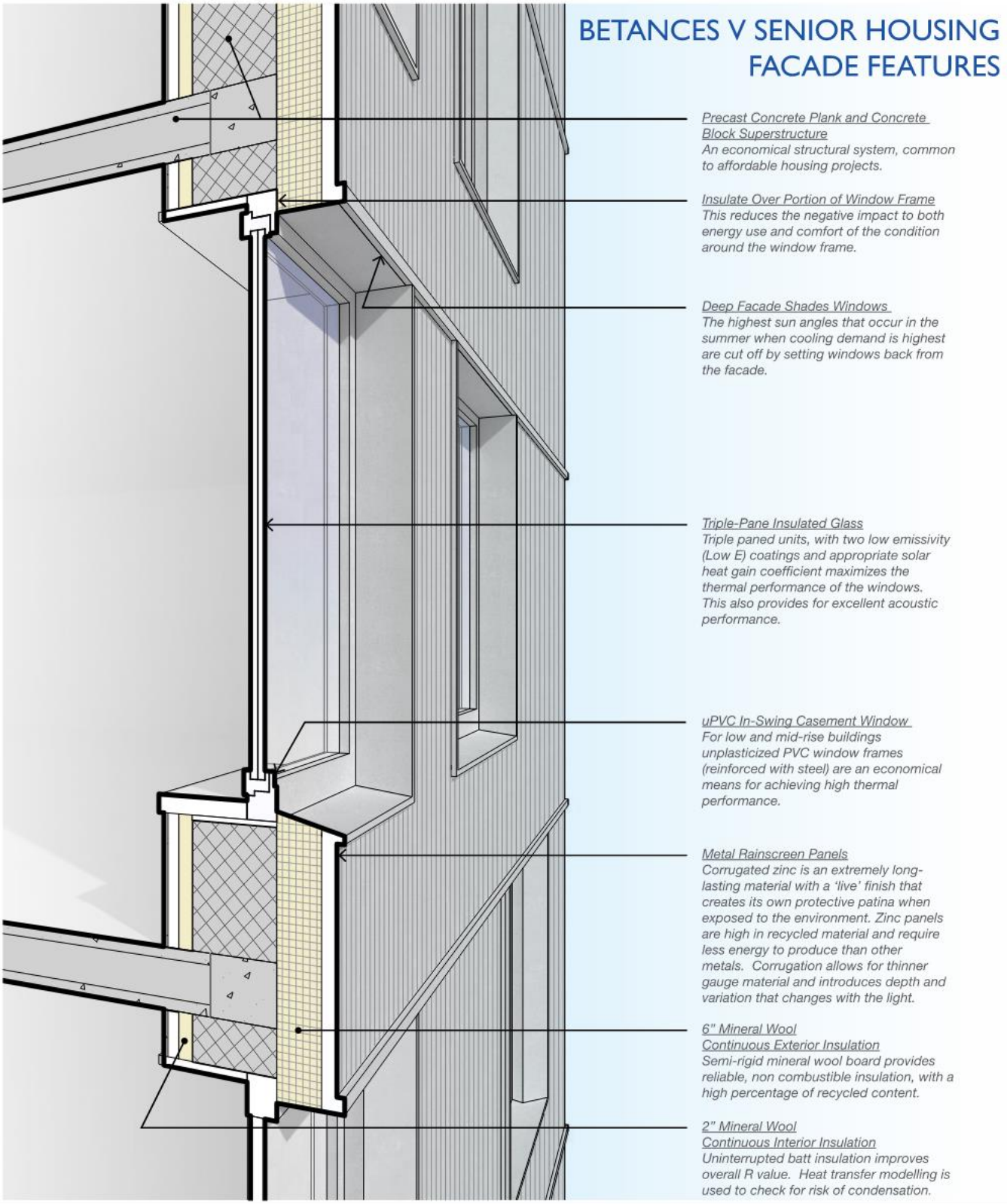
Area section 1	λ [W/(mK)]	Area section 2 (optional)	λ [W/(mK)]	Area section 3 (optional)	λ [W/(mK)]	Thickness [mm]
Concrete Reinforced	1.442		0.000		0.000	203
XPS	0.029		0.000		0.000	51
	0.000		0.000		0.000	0
	0.000		0.000		0.000	0
	0.000		0.000		0.000	0
	0.000		0.000		0.000	0
	0.000		0.000		0.000	0
	0.000		0.000		0.000	0

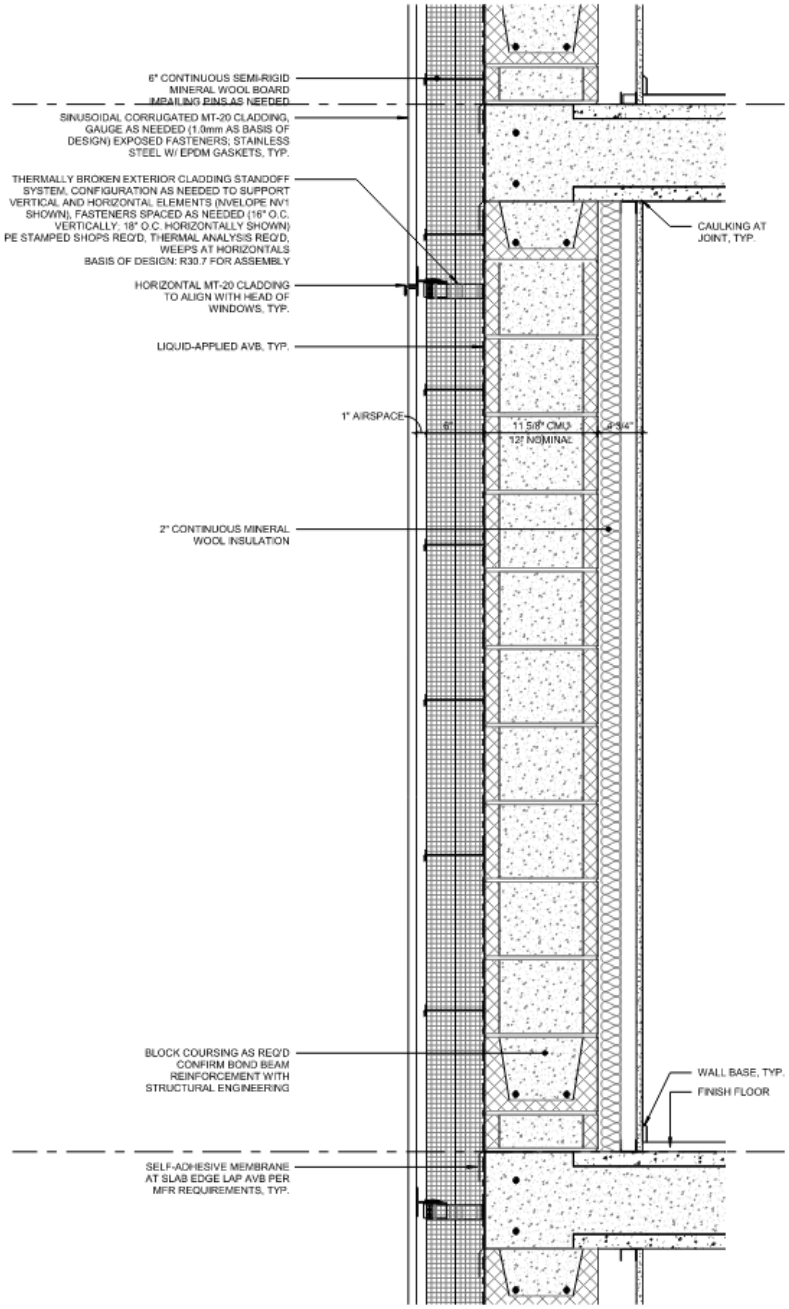
Percentage of sec. 1	Percentage of sec. 2	Percentage of sec. 3	Total
100%	0.0%	0.0%	25.4 cm

U-value supplement: 0.00 W/(m²K)

U-value: 0.492 W/(m²K)

6. Exterior Wall Construction | Konstruktion der Außenwände





TYPICAL METAL PANEL WALL ASSEMBLY

NOT TO SCALE

Assembly no.	Building assembly description
01ud	WT-1.0_Metal Rain Screen_6" Mineral Wool EXT

Heat transmission resistance [m²K/W]

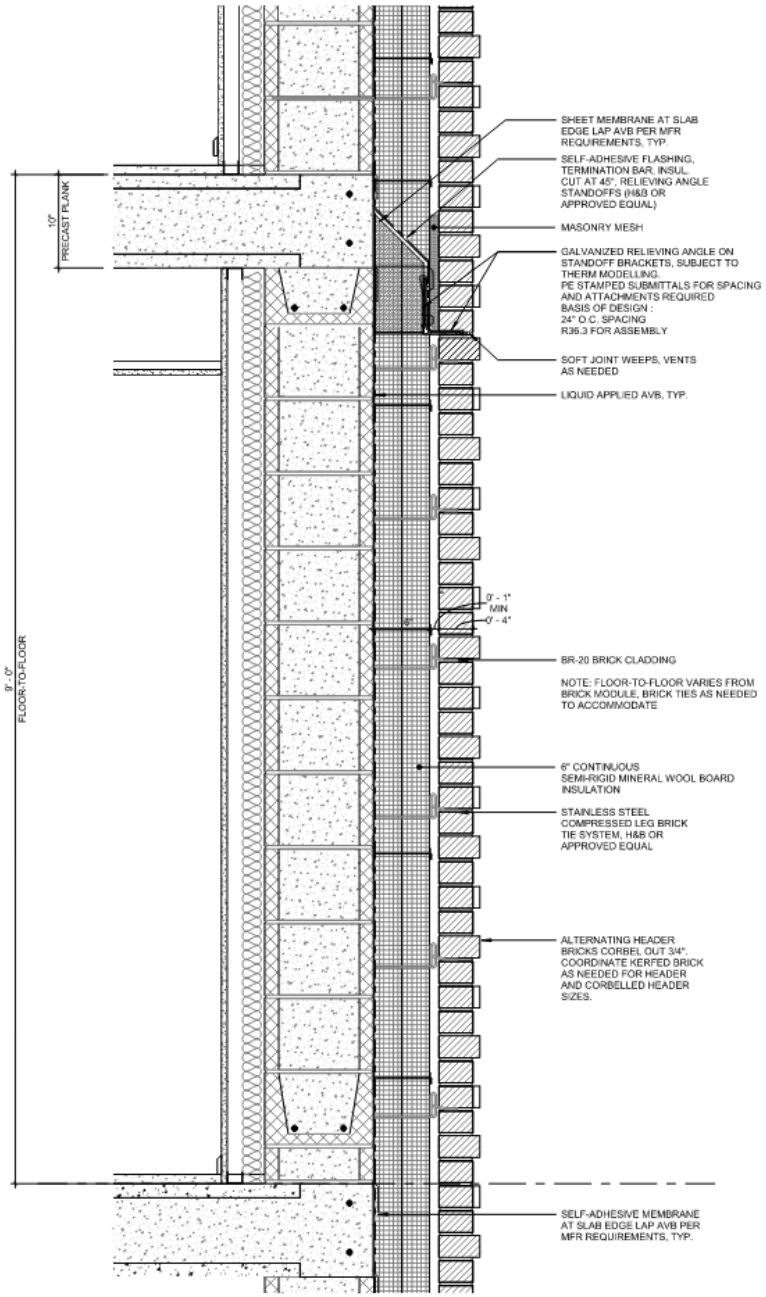
Orientation of building element	2-Wall	interior R_{si}	0.13
Adjacent to	1-Outdoor air	exterior R_{se}	0.04

Area section 1	λ [W/(mK)]	Area section 2 (optional)	λ [W/(mK)]	Area section 3 (optional)	λ [W/(mK)]
Heat 3 Calculation (reference "WT1.0 HEAT3 Calculation")	0.005		0.000		0.000
	0.000		0.000		0.000

Percentage of sec. 1	Percentage of sec. 2	Percentage of sec. 3
100%	0.0%	0.0%

U-value supplement: 0.00 W/(m²K)

U-value: 0.196 W/(m²K)



TYPICAL BRICK VENEER WALL ASSEMBLY

NOT TO SCALE

Assembly no.	Building assembly description
02ud	WT-2.0_Brick w/ GALV Ties _3" KoolTherm K8 EXT

Heat transmission resistance [m²K/W]

Orientation of building element	2-Wall	interior Rsi	0.13
Adjacent to	1-Outdoor air	exterior Rse	0.04

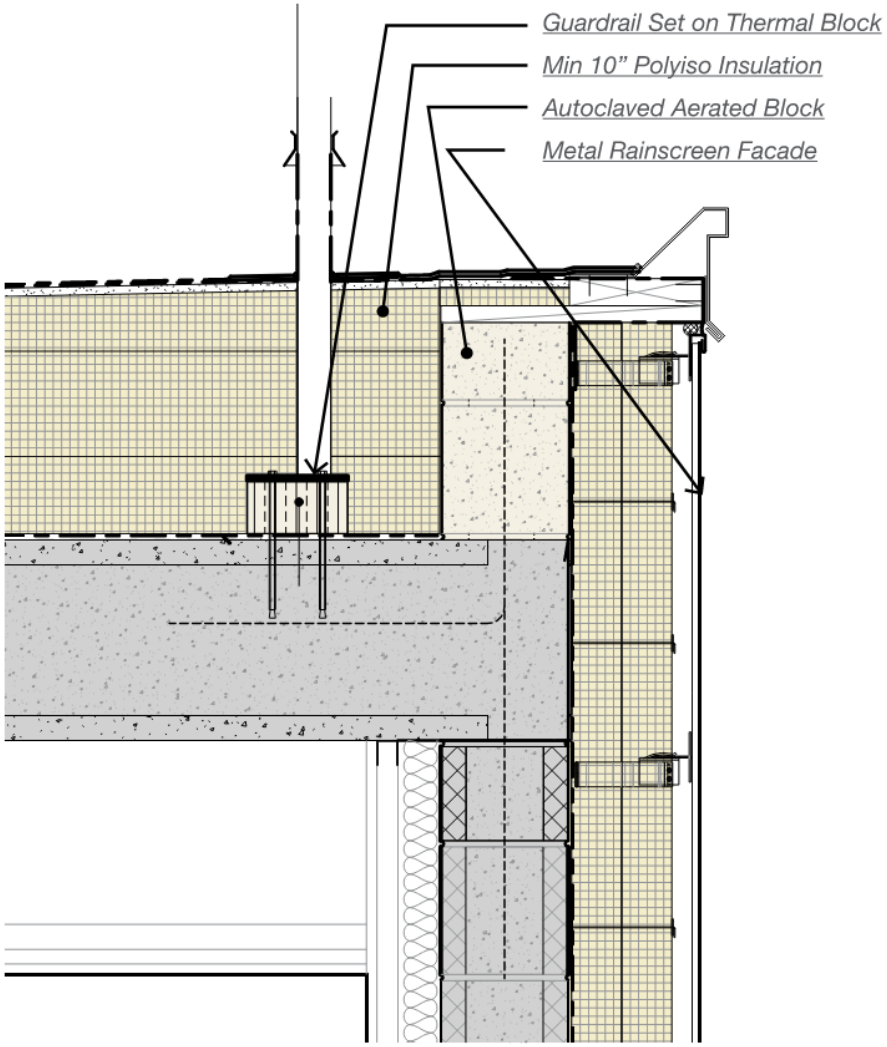
Area section 1	λ [W/(mK)]	Area section 2 (optional)	λ [W/(mK)]	Area section 3 (optional)	λ [W/(mK)]
Heat 3 Calculation (reference "WT2.0 HEAT3 Calculation")	0.005		0.000		0.000
	0.000		0.000		0.000

Percentage of sec. 1	Percentage of sec. 2	Percentage of sec. 3
100%	0.0%	0.0%

U-value supplement: 0.00 W/(m²K)

U-value: 0.187 W/(m²K)

7. Roof Construction | Konstruktion des Daches



Section at Parapet/Roof Coping, Metal Rainscreen
Not to Scale

Assembly no.	Building assembly description					Interior insulation?
06ud	Roof					

Heat transmission resistance [m²K/W]

Orientation of building element: 2-Wall — interior Rsi: 0.13
Adjacent to: 1-Outdoor ai — exterior Rse: 0.04

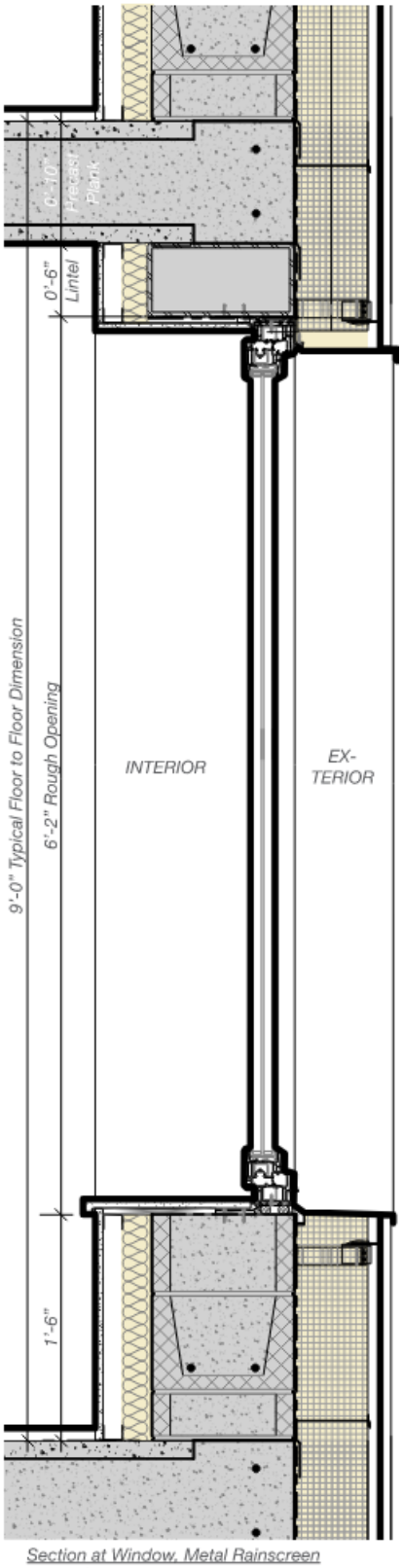
Area section 1	λ [W/(mK)]	Area section 2 (optional)	λ [W/(mK)]	Area section 3 (optional)	λ [W/(mK)]	Thickness [mm]
Concrete Reinforced	1.442		0.000		0.000	305
Polyiso Insulation (10" min)	0.024		0.000		0.000	254
	0.000		0.000		0.000	0
	0.000		0.000		0.000	0
	0.000		0.000		0.000	0
	0.000		0.000		0.000	0
	0.000		0.000		0.000	0
	0.000		0.000		0.000	0

Percentage of sec. 1	Percentage of sec. 2	Percentage of sec. 3	Total
100%	0.0%	0.0%	55.9 cm

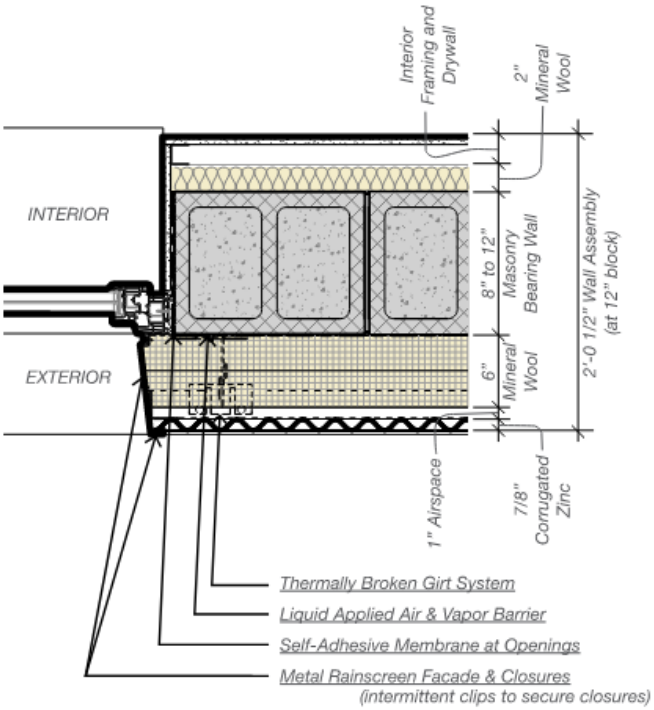
U-value supplement: 0.00 W/(m²K)

U-value: 0.091 W/(m²K)

8. Windows and Window Installation | Fenster und Fenster-Einbau



Section at Window, Metal Rainscreen
Not to Scale

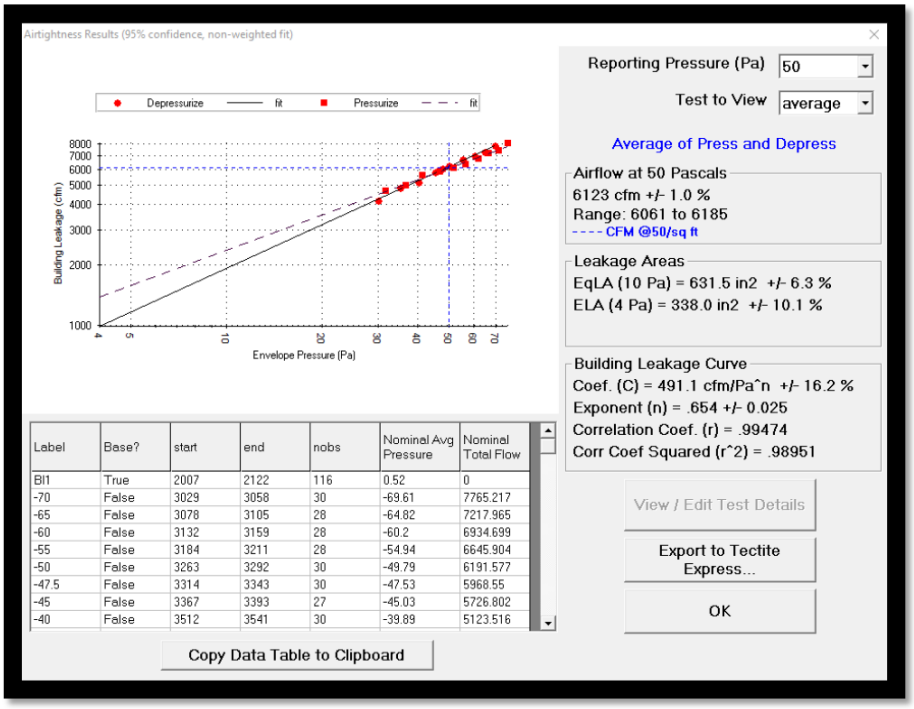


Window Jamb, Metal Rainscreen
Not to Scale

Window Frame Description:	**Schüco Living 82 MD TopAlu**
Manufacturer:	Schüco
Frame u-value:	0.96 W/(m²K)
Glazing	SGG CLIMATOP 6 | 18 ARGON 90 | 4 | 18 ARGON 90 | 4 ; PLANITHERM ONE F2, PLANITHERM ONE F5
Glass u-value:	0.48 W/(m²K)
SHGC	33%

9. Airtight Building Envelope | Beschreibung der luftdichten Hülle

Photo 1:



Label	Base?	start	end	nobs	Nominal Avg Pressure	Nominal Total Flow
BI1	True	2007	2122	116	0.52	0
-70	False	3029	3058	30	-69.61	7765.217
-65	False	3078	3105	28	-64.82	7217.965
-60	False	3132	3159	28	-60.2	6934.699
-55	False	3184	3211	28	-54.94	6645.904
-50	False	3263	3292	30	-49.79	6191.577
-47.5	False	3314	3343	30	-47.53	5968.55
-45	False	3367	3393	27	-45.03	5726.802
-40	False	3512	3541	30	-39.89	5123.516

Whole Building:
- Net Int. Volume: **812,551 ft3**
- Treated Floor Area: 79,920 ft2

TOTAL: Average @ 50Pa: **6123**

✓ The calculated 95% Confidence Interval is less than 8%; final CI was 1%

✓ The result meets the 0.6 ACH50 requirement; **final ACH was 0.45 ACH50**

✓ Determination = PASS

10. Ventilation Equipment | Lüftungsgerät

The project utilized highly efficient rotary heat exchangers.

"A rotary heat exchanger consists of an aluminum wheel with numerous small air passages. Energy is transferred between the supply air and extract air or vice versa when the wheel rotates. This is the most energy efficient heat recovery method with a temperature efficiency that always exceeds 80%."

Manufacturer / Model	**Swegon Gold RX**
Overall Effective Heat Recovery Efficiency	84 %
Overall Spec Input Power	0.37 Wh/m³

11. Short Documentation of PHPP-Results (verification sheet) | PHPP-Ergebnisse

Passive House Verification

Building:	BETANCES_V
Street:	455 East 142nd Street
Postcode/City:	10454 Bronx
Province/Country:	New York / US-United States of America
Building type:	Residential
Climate data set:	US0055c-New York
Climate zone:	4: Warm-temperate — Altitude of location: 8.2296 m
Home owner / Client:	Breaking Ground
Street:	505 8th Ave
Postcode/City:	10018 New York
Province/Country:	New York / US-United States of America
Architecture:	Cookfox Architects
Street:	250 W 57th St
Postcode/City:	10107 New York
Province/Country:	New York / US-United States of America
Mechanical engineer:	Dagher Engineering
Street:	29 Broadway
Postcode/City:	10006 New York
Province/Country:	New York / US-United States of America
Energy consultancy:	Steven Winter Associates
Street:	307 7th Ave
Postcode/City:	10010 New York
Province/Country:	New York / US-United States of America
Certification:	Passive House Academy
Street:	Wicklow County Campus
Postcode/City:	A67 X566
Province/Country:	County Wicklow / IE-Ireland

Year of construction:	2019	Interior temperature winter [°C]:	20.0	Interior temp. summer [°C]:	25.0
No. of dwelling units:	152	Internal heat gains (IHG) heating case [W/m²]:	4.1	IHG cooling case [W/m²]:	4.1
No. of occupants:	174.0	Specific capacity [Wh/K per m² TFA]:	132	Mechanical cooling:	x

Specific building characteristics with reference to the treated floor area

				Criteria	Alternative criteria	Fullfilled?[2]
	Treated floor area m²	7065.3				
Space heating	Heating demand kWh/(m²a)	9	≤	15	-	yes
	Heating load W/m²	12	≤	-	10	
Space cooling	Cooling & dehum. demand kWh/(m²a)	12	≤	18	18	yes
	Cooling load W/m²	10	≤	-	12	
	Frequency of overheating (> 25 °C) %	-	≤	-		-
	Frequency excessively high humidity (> 12 g/kg) %	0	≤	10		yes
Airtightness	Pressurization test result n_{50} 1/h	0.5	≤	0.6		yes
Non-renewable Primary Energy (PE)	PE demand kWh/(m²a)	119	≤	120		yes
Primary Energy Renewable (PER)	PER demand kWh/(m²a)	87	≤	-	-	-
	Generation of renewable energy (in relation to pro-jected 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:

Issued on: | City: