



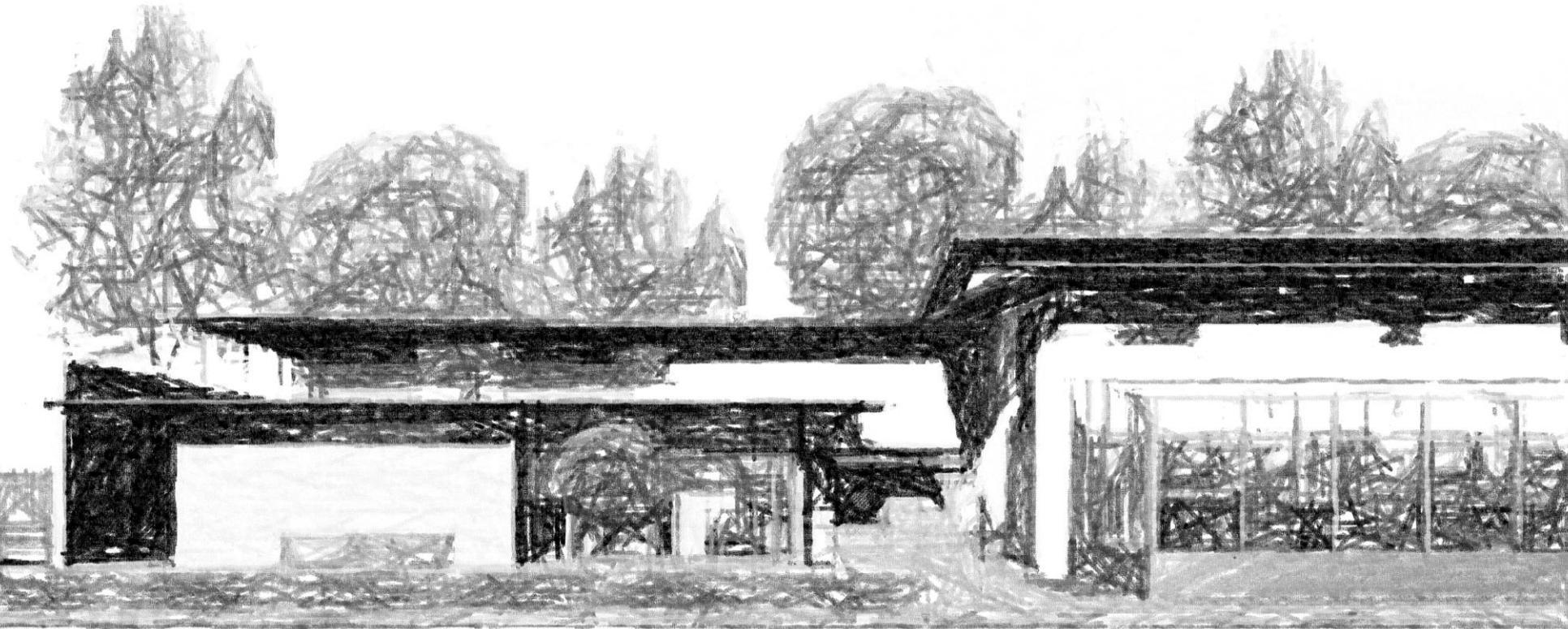
STATE UNIVERSITY OF NEW YORK
COLLEGE OF ENVIRONMENTAL
SCIENCE AND FORESTRY

SYRACUSE UNIVERSITY

OUR HOME AT SMOKEY HOLLOW

“The architect’s role is to fight for a better world, where he (they) can produce an architecture that serves everyone and not just a group of privileged people.”

- Oscar Niemeyer





0.9% of New York Students have ASD



Based on that percentage, there are roughly 144,000 adults aged 21+ in New York State diagnosed with ASD







OUR HOME AT SMOKEY HOLLOW



Christopher Community, Inc.

Christopher Community Inc.

Currently manages over 3,000 units and more than 100 buildings. They also specialize in low- and moderate-income developments.



Autistic Service Inc.
Williamsville, NY

CIP Amherst
Amherst, NY

Syracuse

Center for Discovery
Harris, NY

SustainAbility Services
Accord, NY

Developmental Disabilities Institute
Smithtown, NY

The nearest ASD assisted living community is
114 miles away from Syracuse



Maggie and her dad,
Dan Schmidt



Mike and his mom,
Trish Albanese



Fig. 1. ADHD & Autism, n.d.



Dr. Andy Lopez-Williams



Quinlan Hooker
Energy Lead



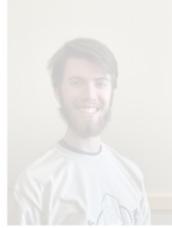
Connor Young
Engineering Lead



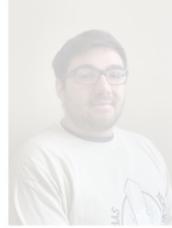
Vedyn Mishra
Architecture Lead



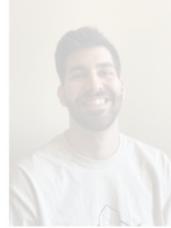
Nathaniel Hengy
Finance Lead



Christopher Carrano
Director of Operations



Noah Townsend
Team Lead



Ryan Badke
Team Lead



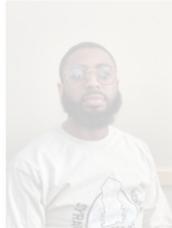
Heather Warren



Jean-Claude Rigano



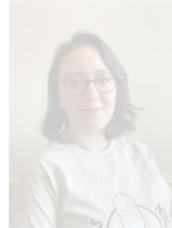
Darrelle Butler Jr.



Roman Hyronvets



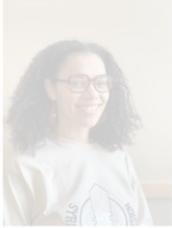
Sena Gokkus



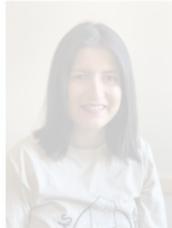
Kyle Slusarczyk



Nikita Richardson



Carol Pacheco



Erin Englehart



Aditya Surendhra



Trisha Gupta



Lucas Pharmer





Puzzle Pieces:
Residents with ASD

Home Border:
Durability & Sensory Safe Design

Green Circle:
Net-Zero Energy Goals

Hands:
Health & Wellbeing

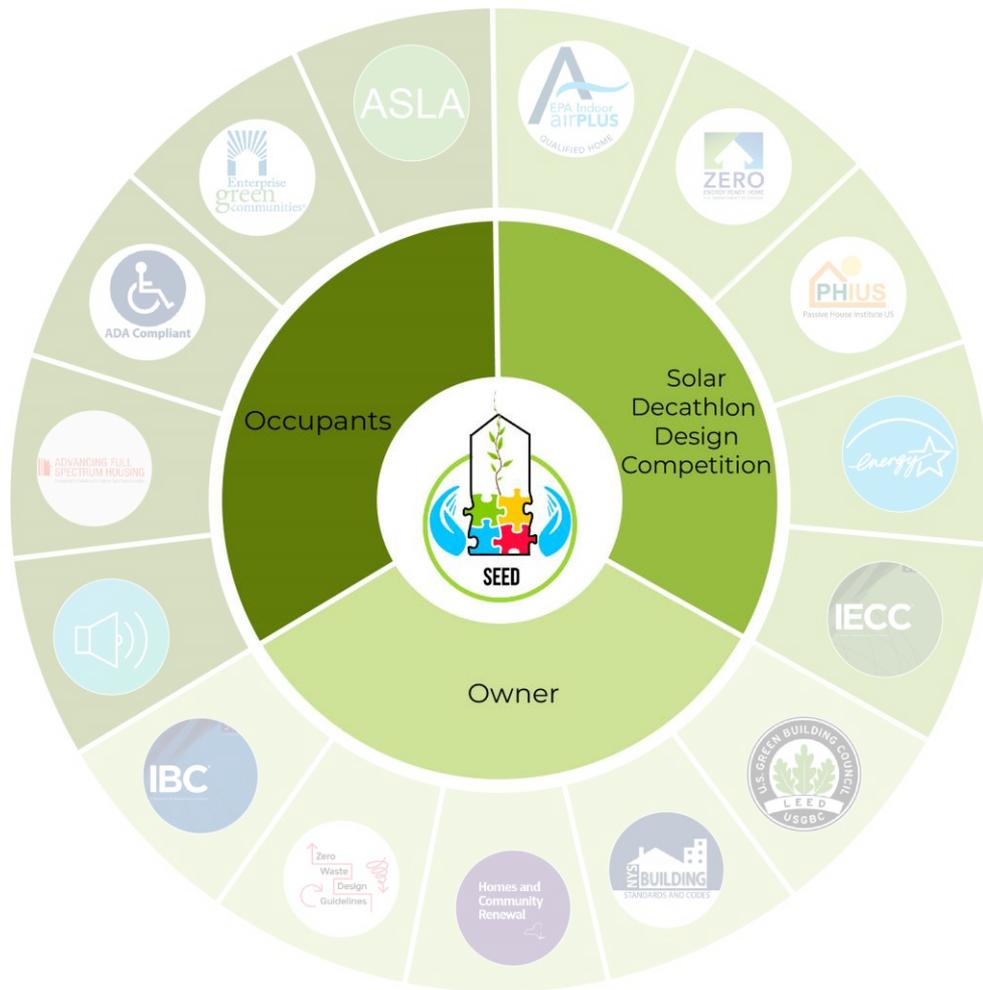
Plant:
Biophilic Design



ISSUES

OUR GOALS

INTRODUCTION





OUR HOME AT SMOKEY HOLLOW



WIND WHEEL

LOCATION: Syracuse Hancock Intl Arpt, NY, USA
Latitude/Longitude: 43.12° North, 76.1° West, **Time Zone from Greenwich -5**
Data Source: TMY3 725190 WMO Station Number, **Elevation 410 ft**

LEGEND

TEMPERATURE (Deg. F)

- < 32
- 32 - 69
- 69 - 81
- 81 - 100
- > 100

RELATIVE HUMIDITY (%)

- <30
- 30-70
- >70

All Hours Selected Hours

1 a.m. through midnight

All Months Selected Months

JAN through DEC

One Month JAN Next Month

One Day 1 Next Day

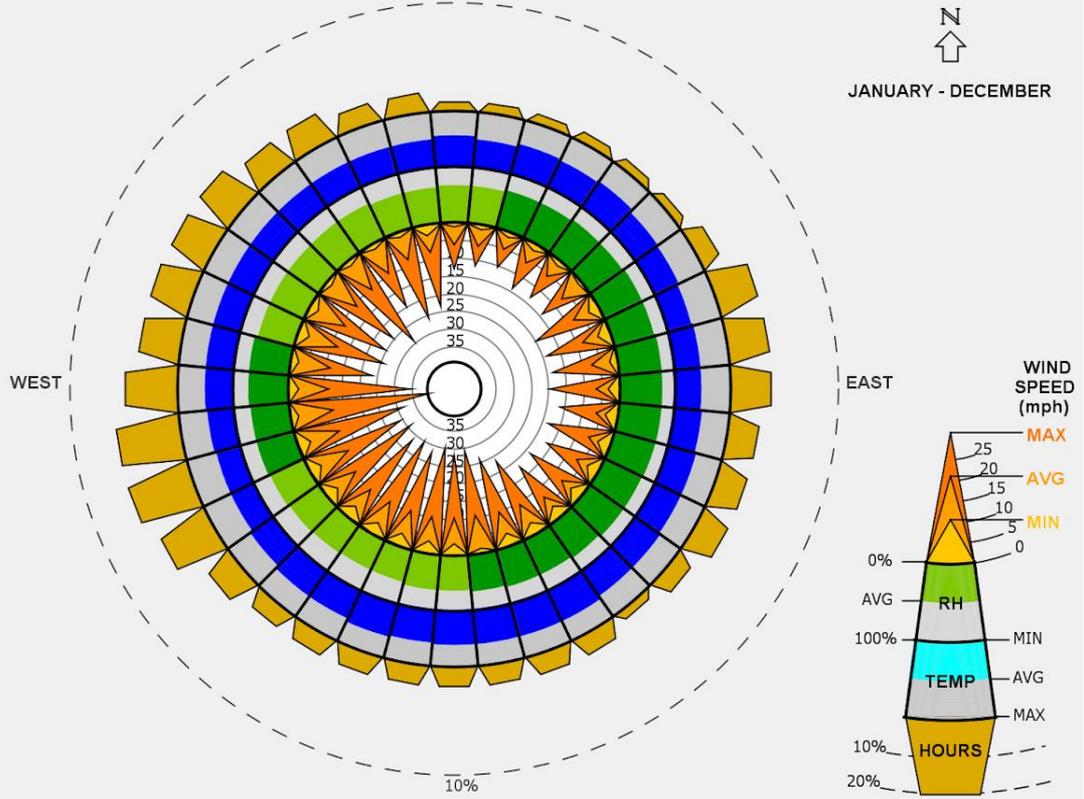
Animate

- Monthly
- Daily
- Hourly

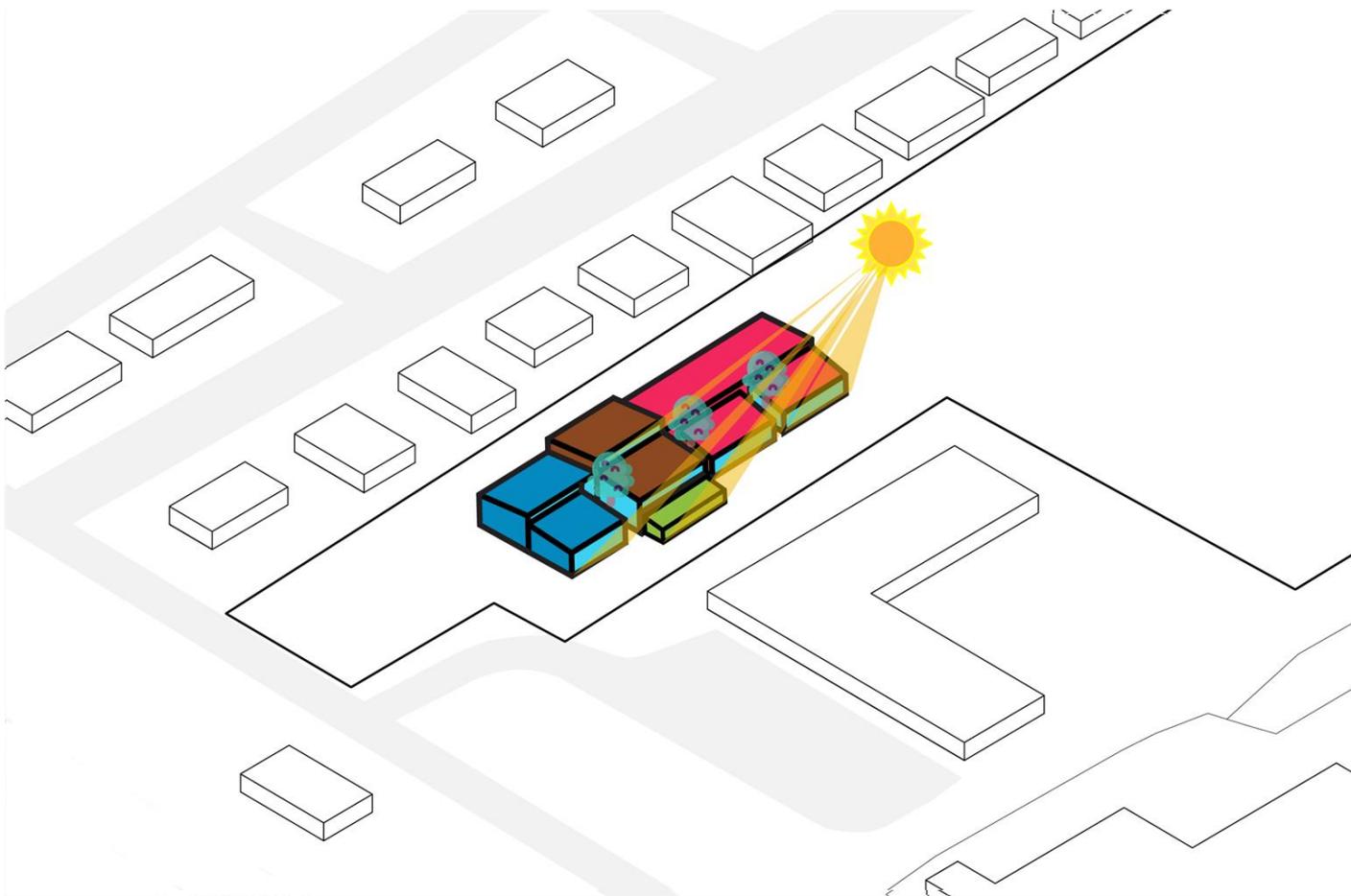
Start

Pause

Stop







MASSING DEVELOPMENT

ARCHITECTURE



Serenity
safe



Healer and
Wellness



Biophilic
Design



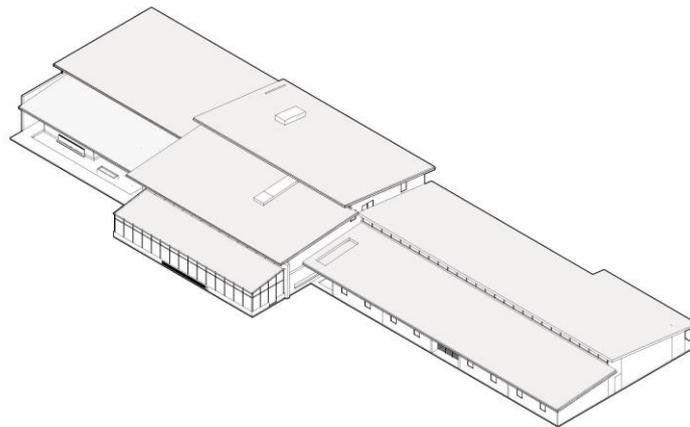
Ample Daylighting



Greenhouse for Healing



100% Water Reuse



Open Spaces



Therapeutic Landscape



Autism Guidelines

DESIGN ELEMENTS

ARCHITECTURE



-  1 Bedroom Units
-  2 Bedroom Units
-  Common Spaces
-  Mechanical Space

FIRST FLOOR PLAN

ARCHITECTURE



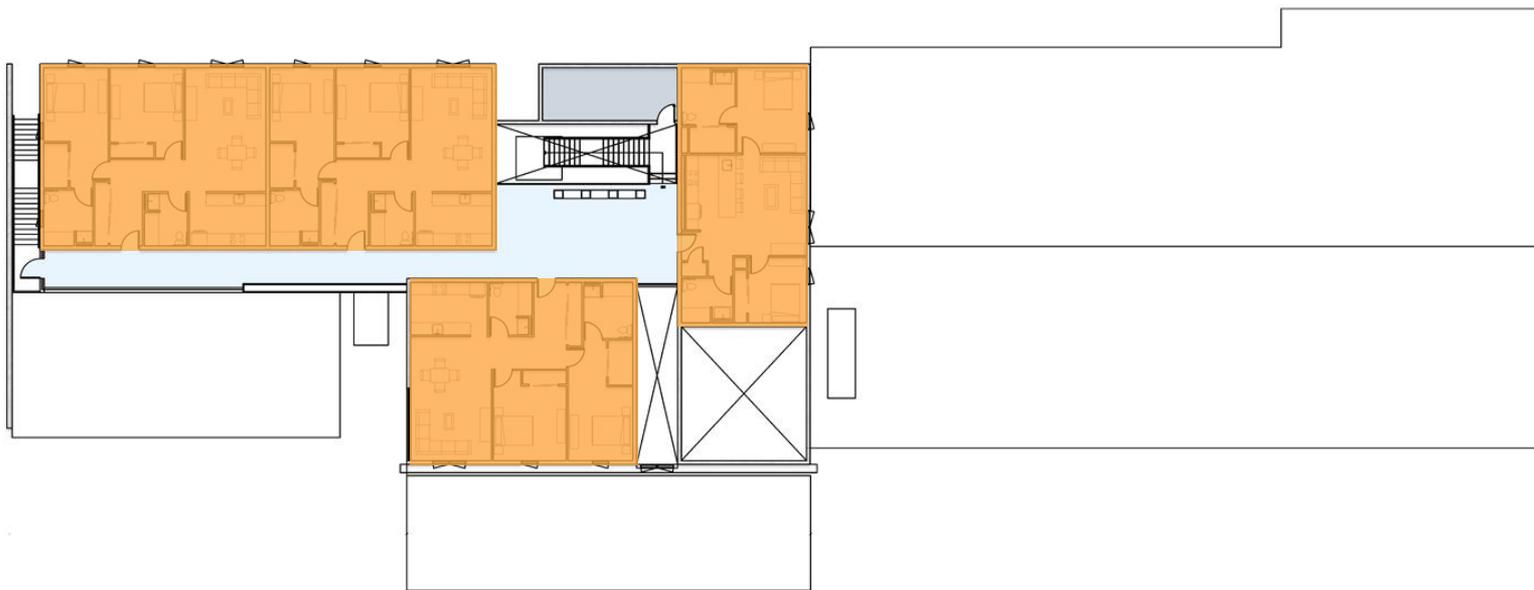
ADA-FIT
Layout



Minimalistic
Design



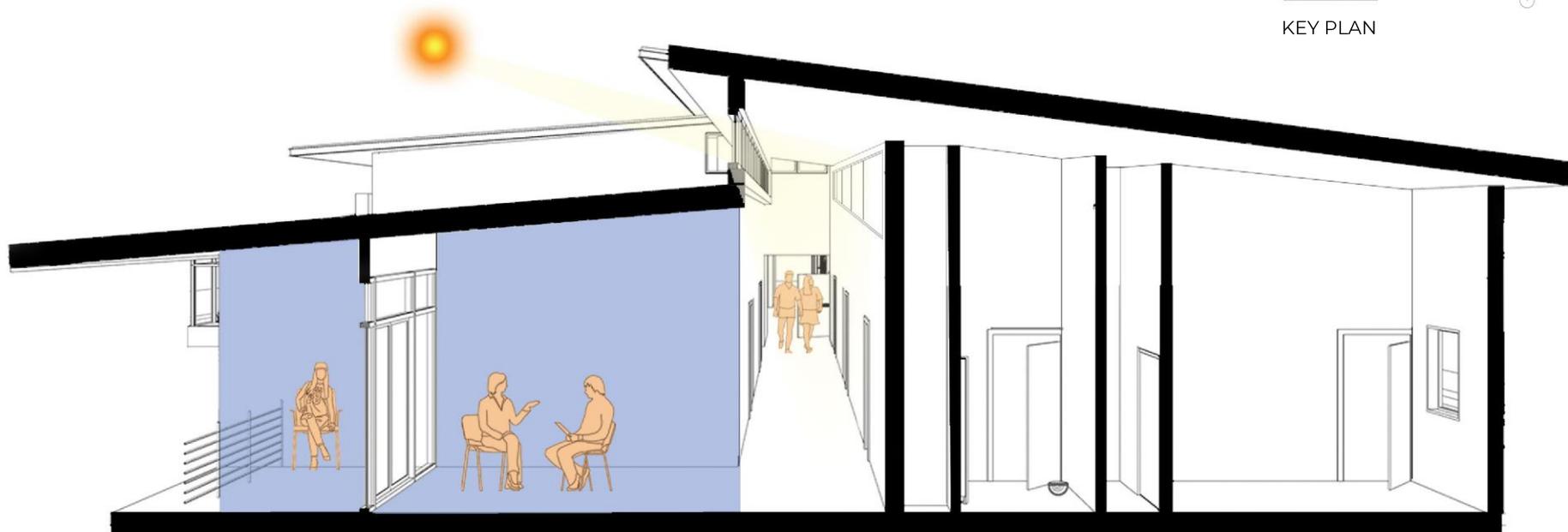
Family
and Stability



-  1 Bedroom Units
-  2 Bedroom Units
-  Common Spaces
-  Mechanical Space



KEY PLAN



INTERACTION SPACES

ARCHITECTURE



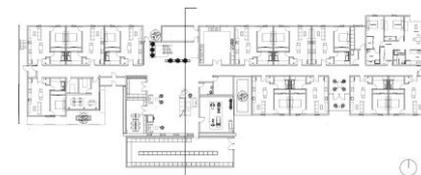
Familiarity and stability



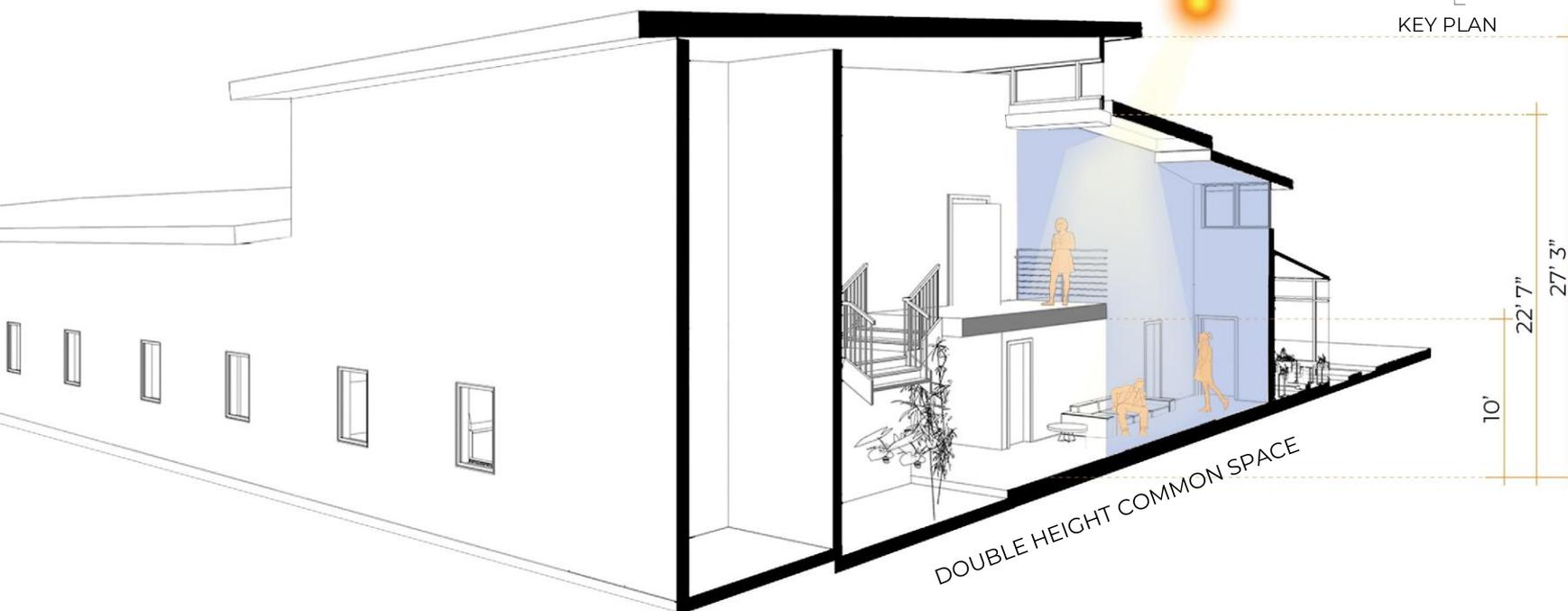
Choice for interaction



Flexible Spaces



KEY PLAN



DOUBLE HEIGHT COMMON SPACE

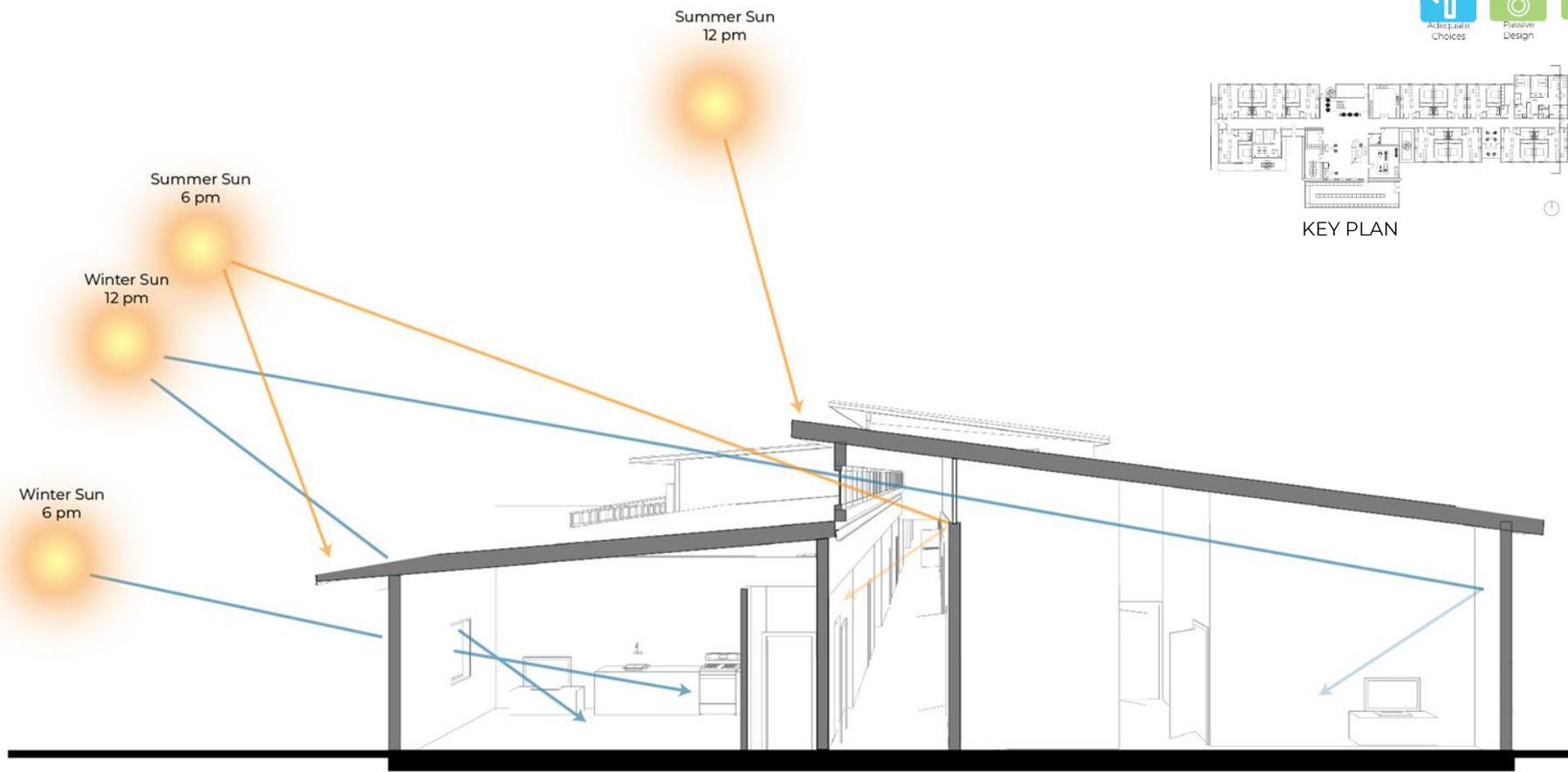
GATHERING SPACE

ARCHITECTURE



GREENHOUSE

ARCHITECTURE

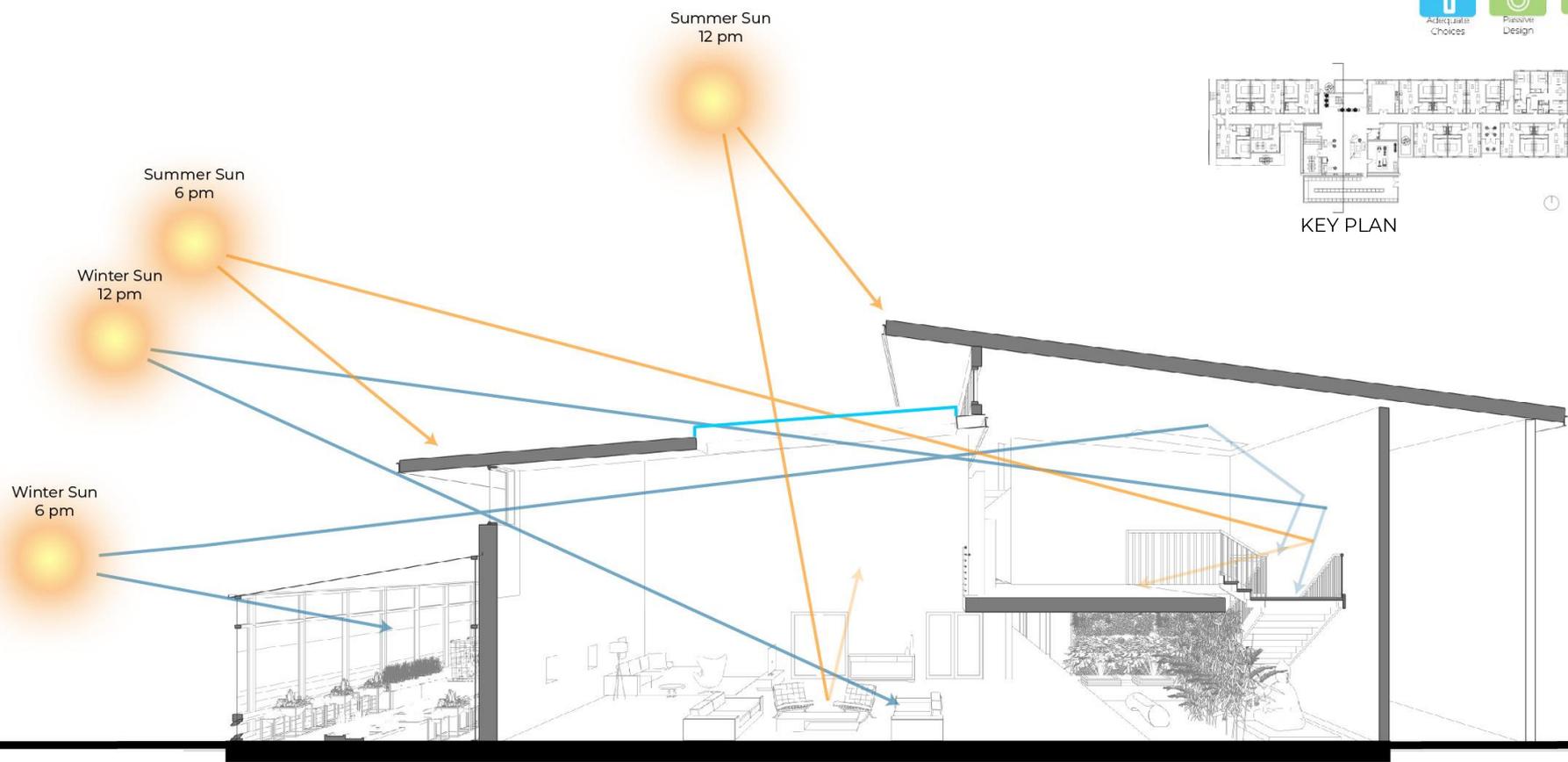


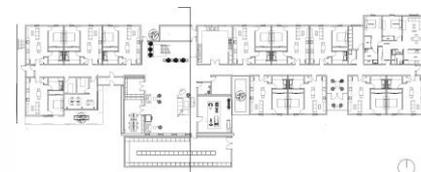
PASSIVE DESIGN

ARCHITECTURE



KEY PLAN





KEY PLAN



BIOPHILIC DESIGN

ARCHITECTURE



Anxiety



Overstimulation



Difficulty with Changes



CONCRETE



WOOD COMPOSITE
PANEL



CORTEN STEEL



STONE VINEER



Adapt
Layout



Family
and Stability



Minimalistic
Design



1 Bedroom Unit



2 Bedroom Unit

MODULARITY

ARCHITECTURE



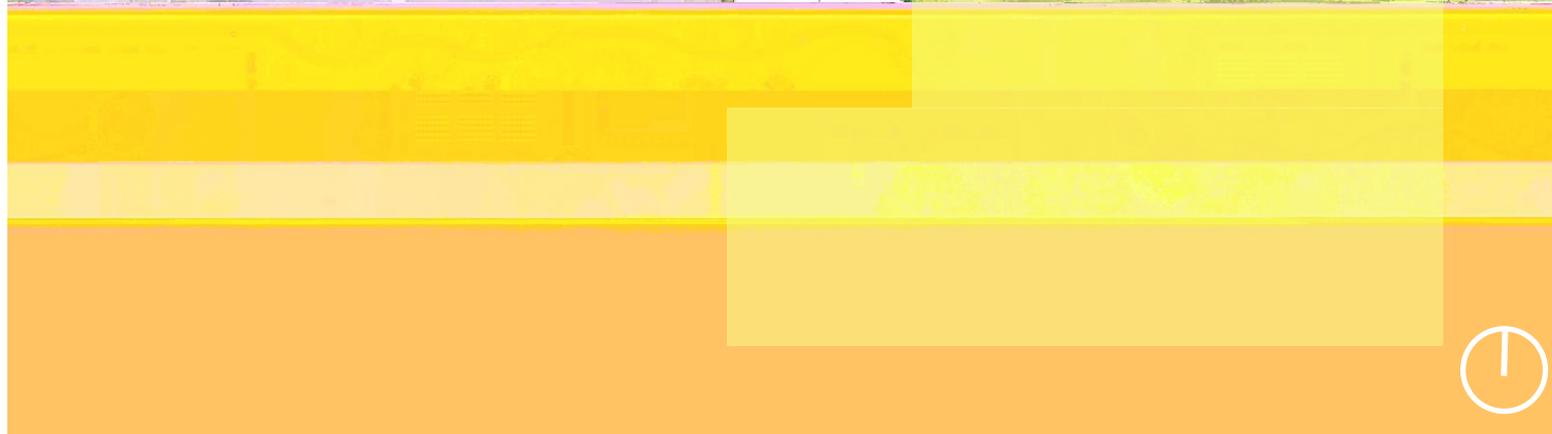
Healing
Landscape



Choice for
Interaction



Anxiety



SITE PLAN

ARCHITECTURE



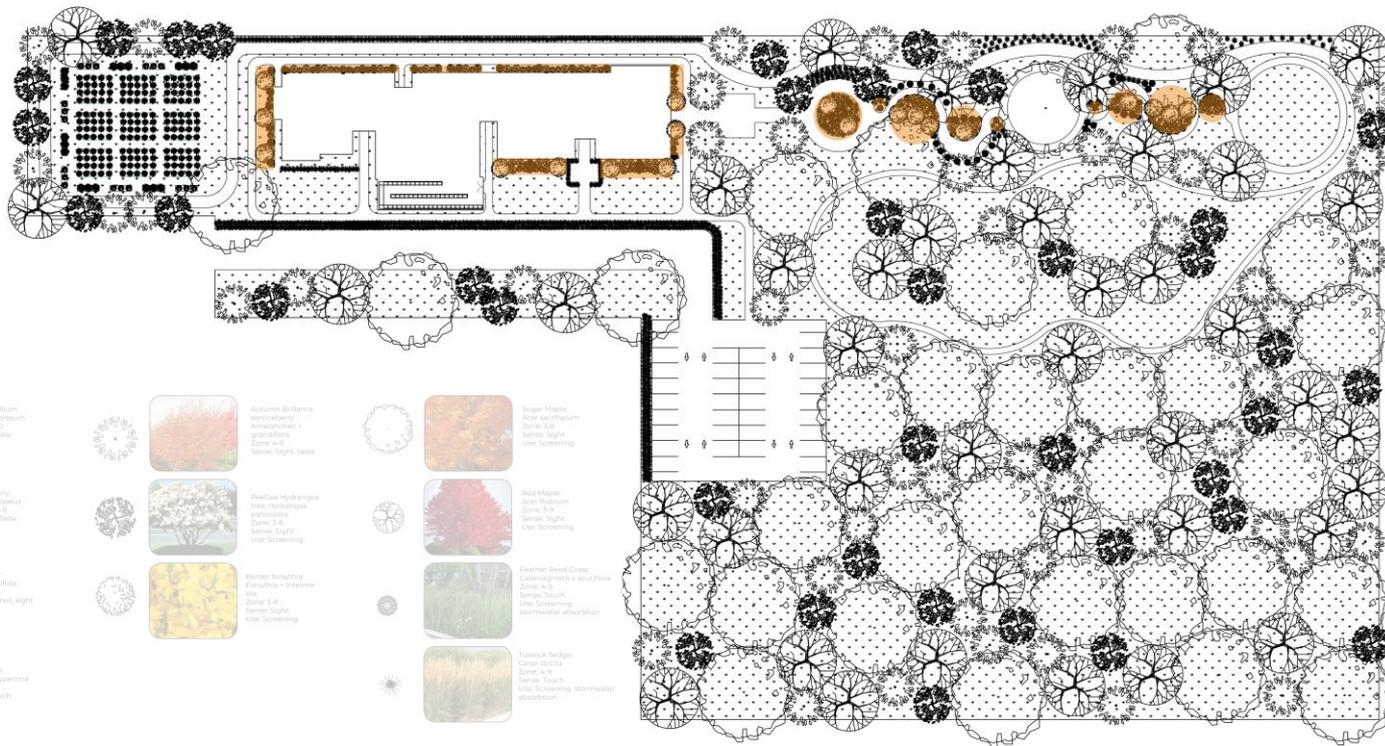
Efficacy



Serenity safe

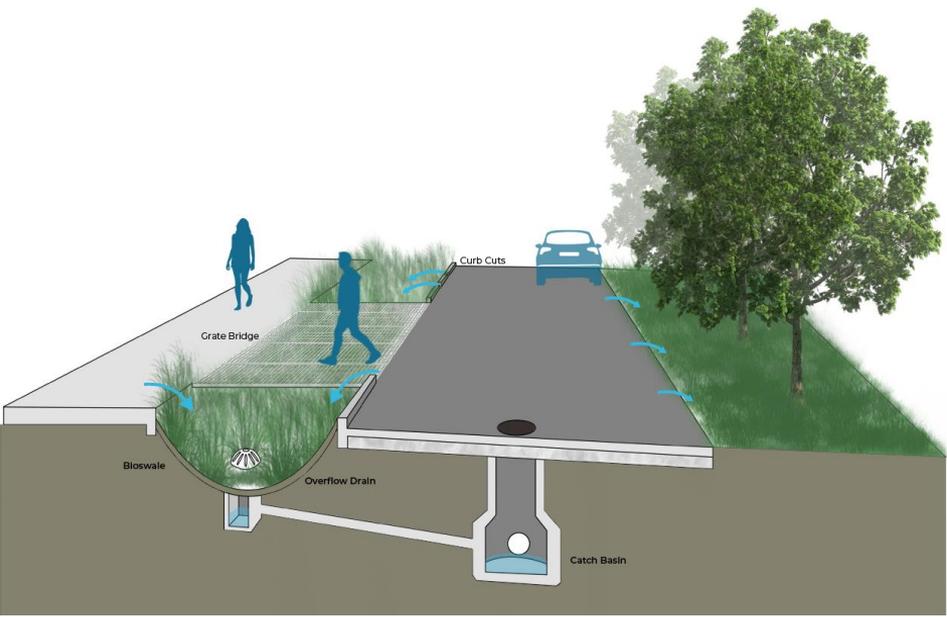


Healing Landscape

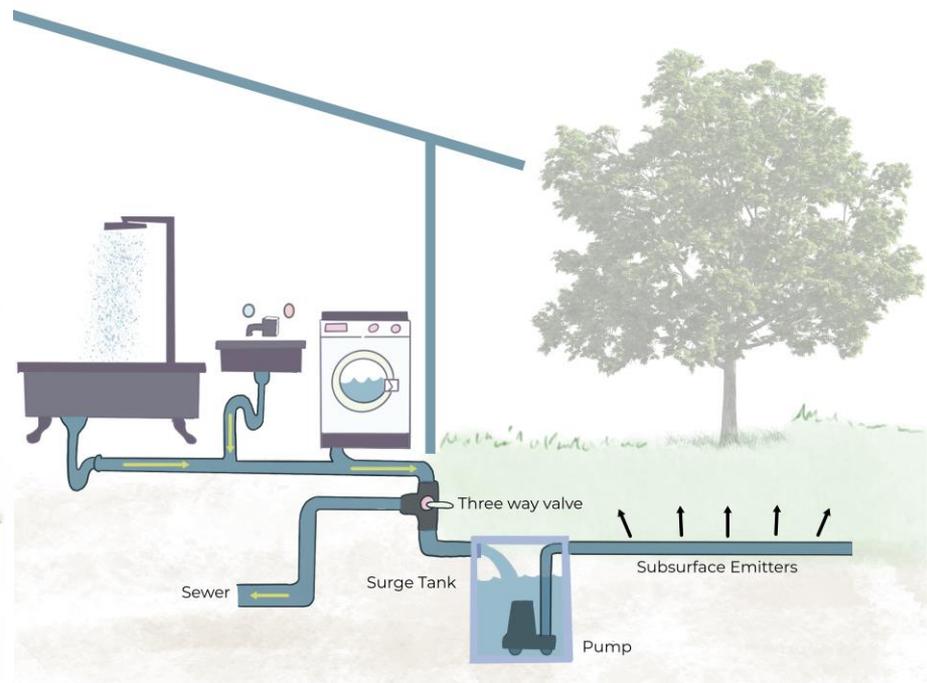


Planting List 100 Smoothing Habitat

	 Chinese Allium <i>schonoprospermum</i> Zone 3-5 Senses: Taste		 Autumn Brilliance <i>penicillata</i> v. <i>grandiflora</i> Zone 4-5 Senses: Sight, Taste		 Sugar Maple <i>Acer saccharum</i> Zone 3-5 Senses: Sight Use: Screening
	 Raspberry <i>Rubus idaeus</i> Zone 4-5 Senses: Taste		 PinkCape Hydrangea <i>paniculata</i> <i>penicillata</i> Zone 3-5 Senses: Sight Use: Screening		 Red Maple <i>Acer rubrum</i> Zone 3-5 Senses: Sight Use: Screening
	 Lavender <i>lanceolata</i> Zone 3-5 Senses: Smell, Sight		 Border Forsythia <i>intermedia</i> v. <i>intermedia</i> Zone 3-5 Senses: Sight Use: Screening		 Crayon Reed Grass <i>Calamagrostis v. acutiflora</i> Zone 3-5 Senses: Touch Use: Screening, Atmospheric alteration
	 Lamb's Ear <i>stachyosepium</i> Zone 4-5 Senses: Touch		 Treadsoft Garden <i>Zone 4-5</i> Senses: Touch Use: Screening, Atmospheric alteration		



STORMWATER SECTION



GREYWATER DIAGRAM

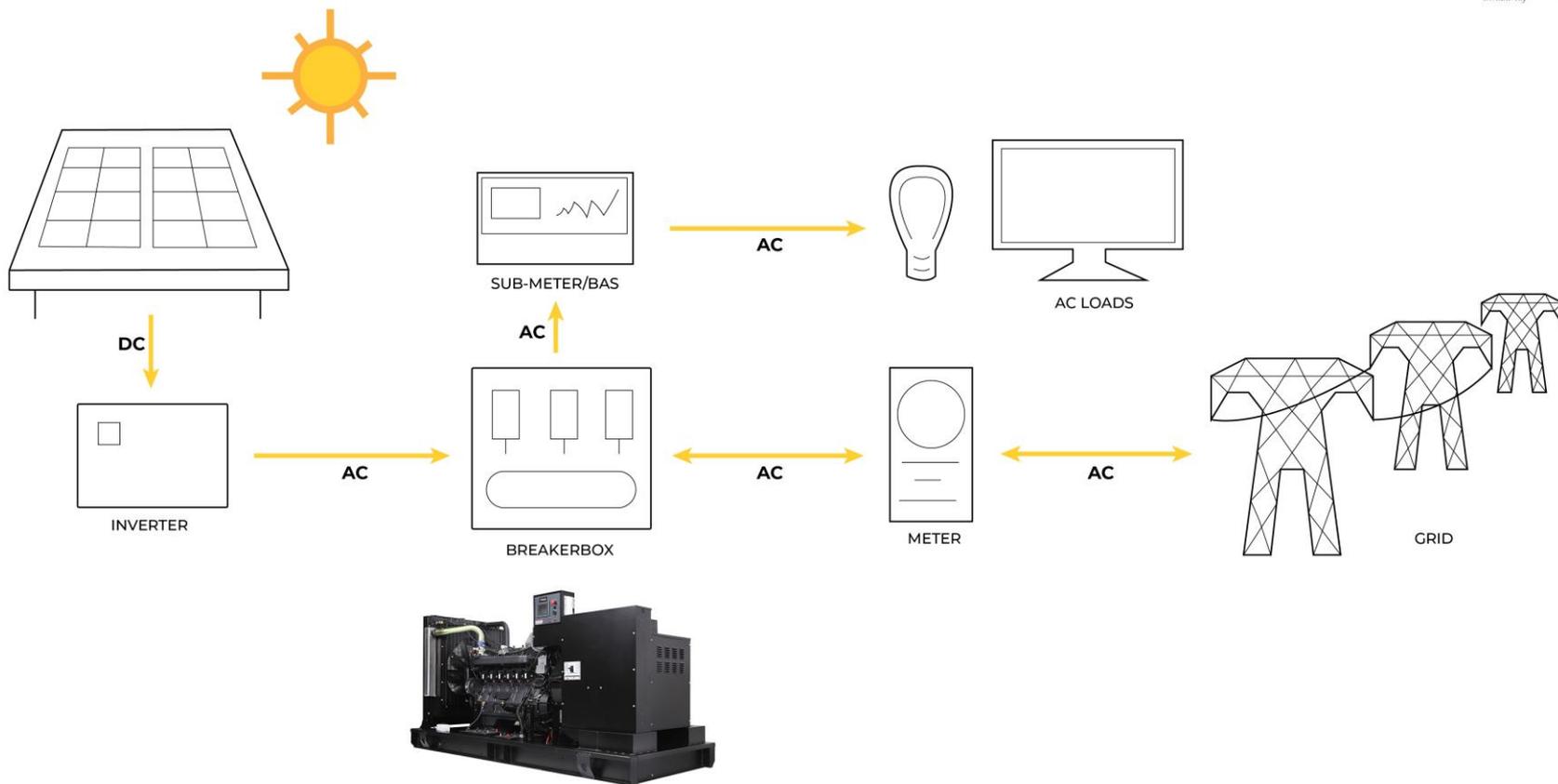
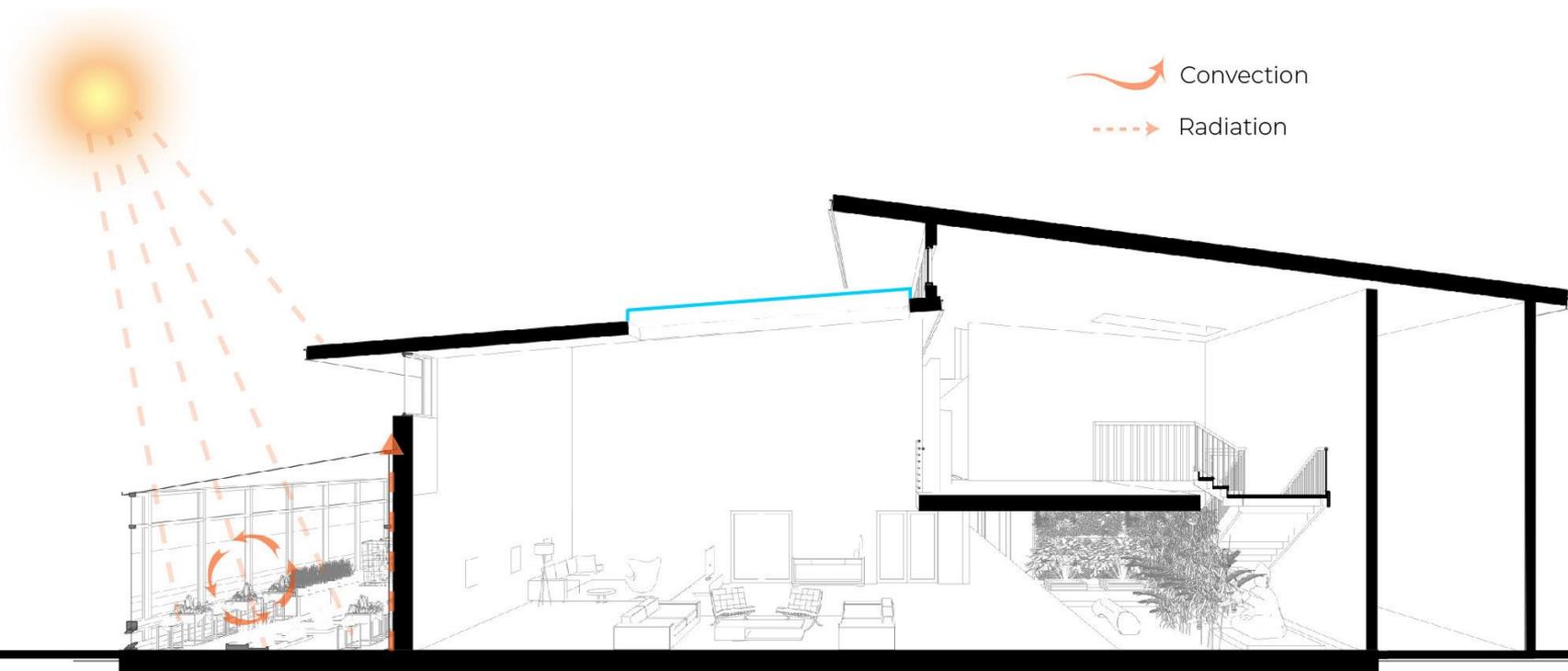


Fig. 2. Generac. n.d.

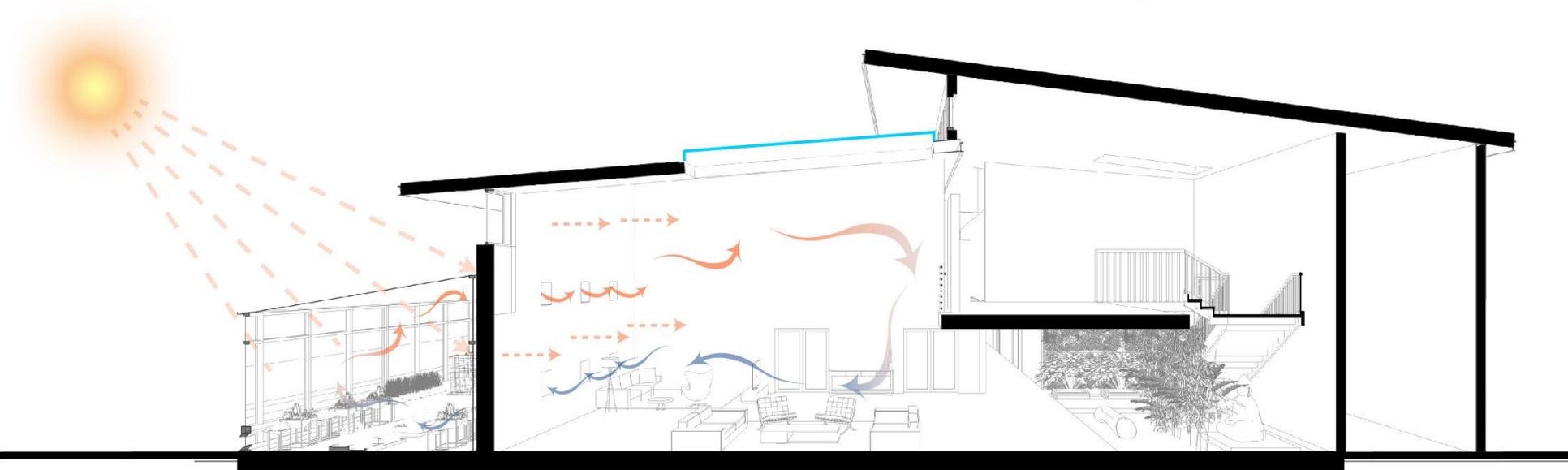


Convection
Radiation

SECTION THROUGH TROMBE WALL (SUMMERS)

PASSIVE HEATING

COMFORT & IAQ



SECTION THROUGH TROMBE WALL (WINTERS)

PASSIVE HEATING

COMFORT & IAQ



Durable
Materials



Passive
Design



Minimalistic
Design



Fig. 3. Trane Trace 3D Plus, n.d.

Site Performance

Net Source Energy Use Intensity (EUI)	26.7 kBtu/ft ²
Annual Electrical Consumption	261,931 kWh
Annual Peak Electrical Demand	105 kW

Site Performance

Net Source Energy Use Intensity (EUI)	53.4 kBtu/ft ²
Annual Electrical Consumption	272,458 kWh
Annual Peak Electrical Demand	136 kW

OUR HOME AT SMOKEY HOLLOW WALL
CONSTRUCTION

STANDARD WALL CONSTRUCTION



Fig. 4. Carrier. n.d.

10 ton Carrier VRF

- 2X 10 ton Carrier VRF Outdoor Unit
- IEER 23.20 compared to 20.80 of typical split system



Fig. 5. Carrier. n.d.

Carrier VRF Indoor Unit

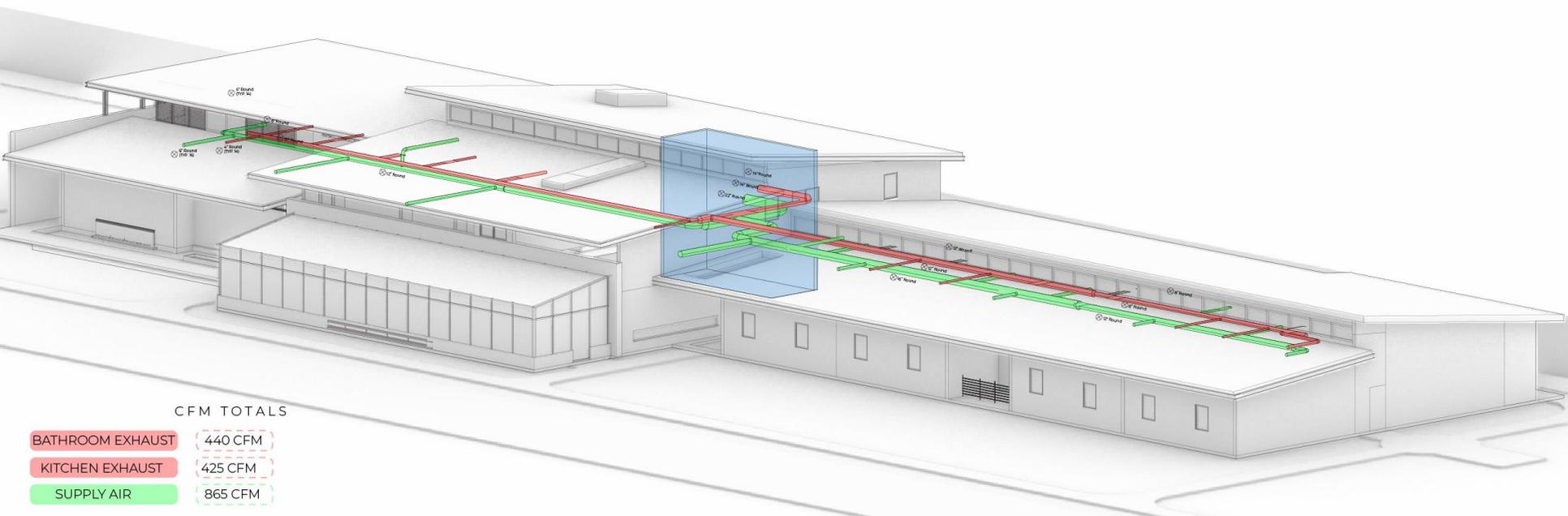
- Sound pressure of 32.8 dBA compared to 40 dBA of ASHRAE Chapter 48 noise allowances



Fig. 6. RenewAire. n.d.

MERV 13 filters

- Only Two penetrations
- Follows ASHRAE 62.2 regardless of building size.
- .6 air changes per hour at 50 pascals





Maggie's cat-
Oreo 45db

Party Wall- STC 63

Hallway Wall- STC 55



FOAM S.T.O.P.[™] Melamine Foam Linear Wedges

- **Class A Fire Retardant**
- **High Performance Absorption**
- **Fiber Free**
- **Anechoic Wedge Design**

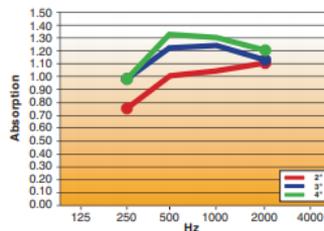


Chart for comparison of Noise Reduction Coefficients (NRC)							
Standard	125Hz	250Hz	500Hz	1KHz	2KHz	4KHz	NRC
2"	.09	.28	.79	.94	1.00	1.04	.75
3"	.10	.48	.91	1.11	1.11	1.14	.90
4"	.16	.56	1.11	1.13	1.13	1.21	1.00

Chart for comparison of Noise Reduction Coefficients (NRC)							
Max Wedge	125Hz	250Hz	500Hz	1KHz	2KHz	4KHz	NRC
6"	.22	1.07	1.27	1.34	1.27	1.15	1.26
8"	.39	1.05	1.44	1.38	1.33	1.19	1.33

Fig. 7 Acoustical Surfaces, Inc. n.d.

Ceilings and Floor- STC 58



Durable
Materials



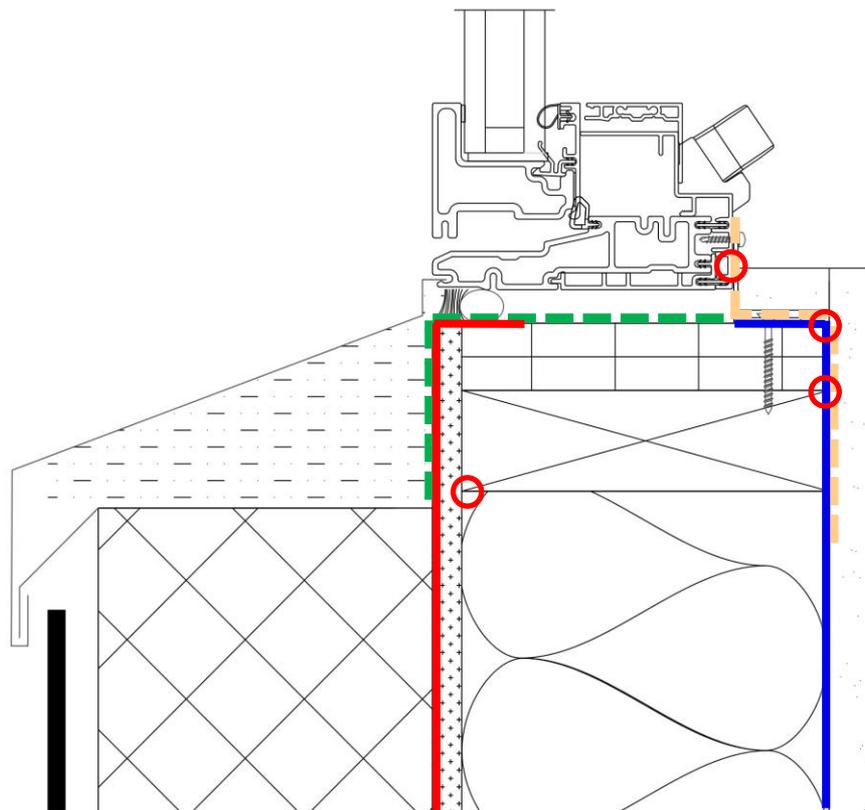
Passive
Design



Minimalistic
Design

Standard Wall

Our Home at Smokey Hollow



Intello smart vapor barrier

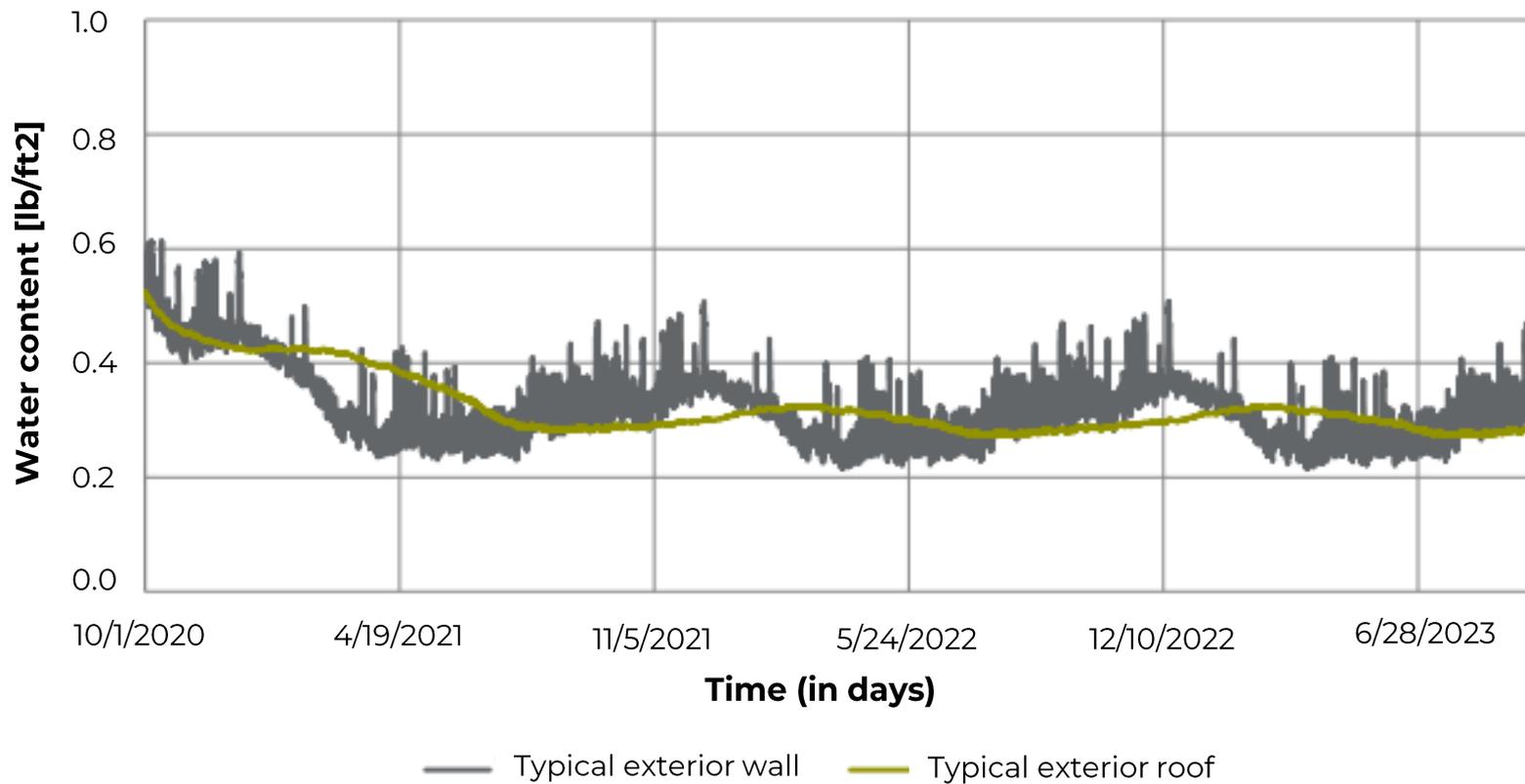
Zip Sheathing

Siga Wigluv

Siga Rissan

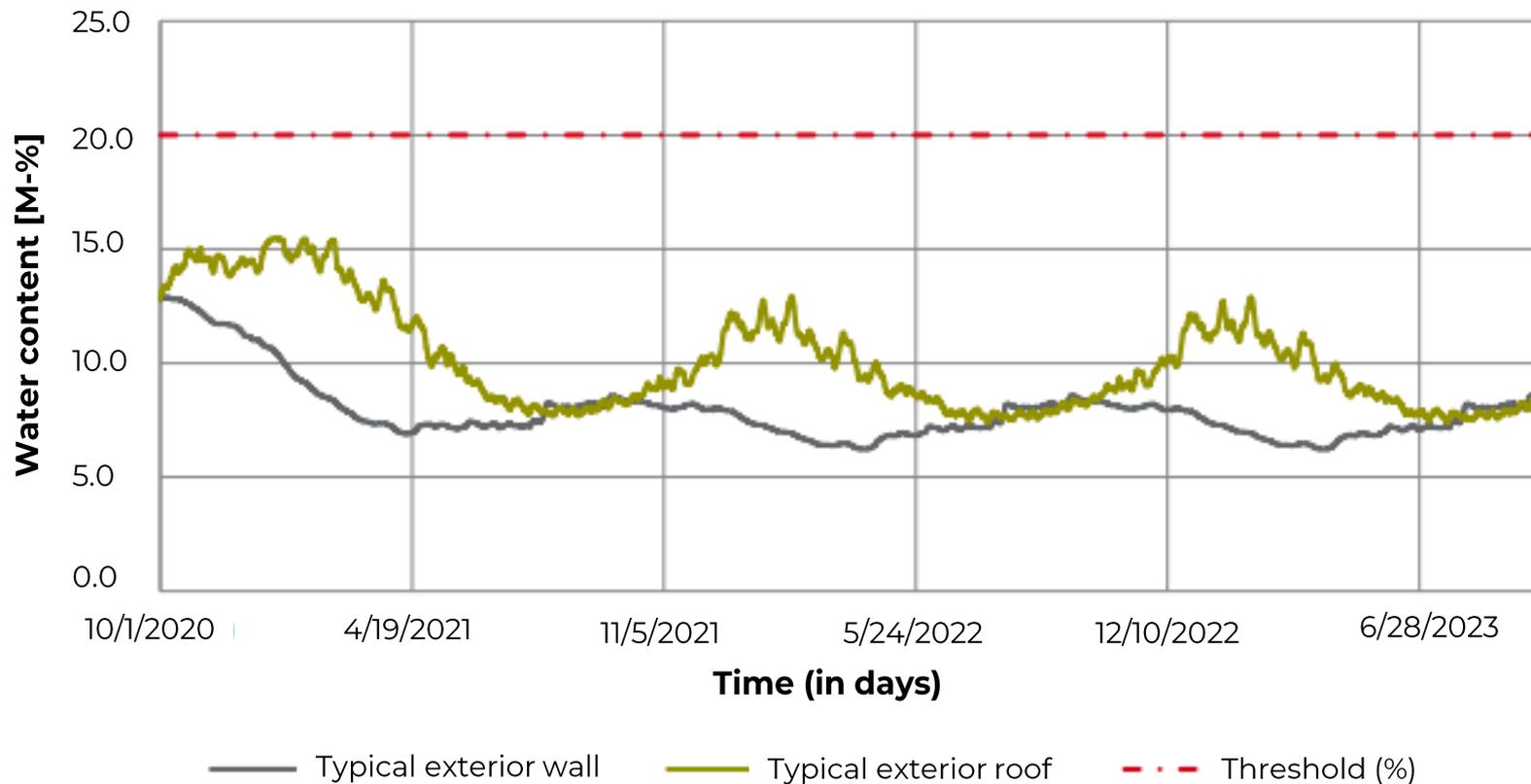


Total Water Content



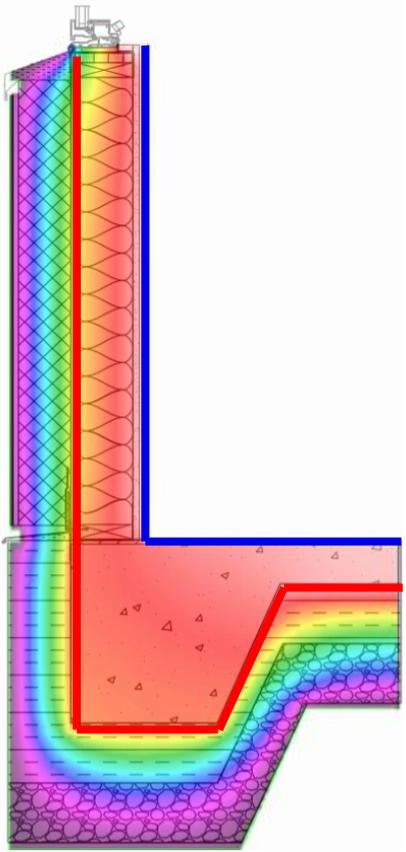


OSB Sheathing Moisture Content

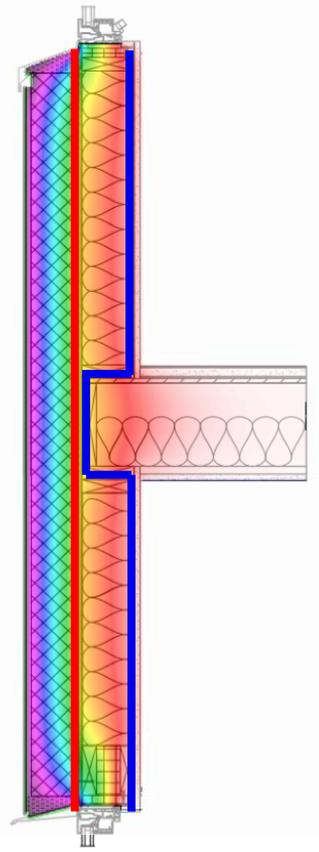




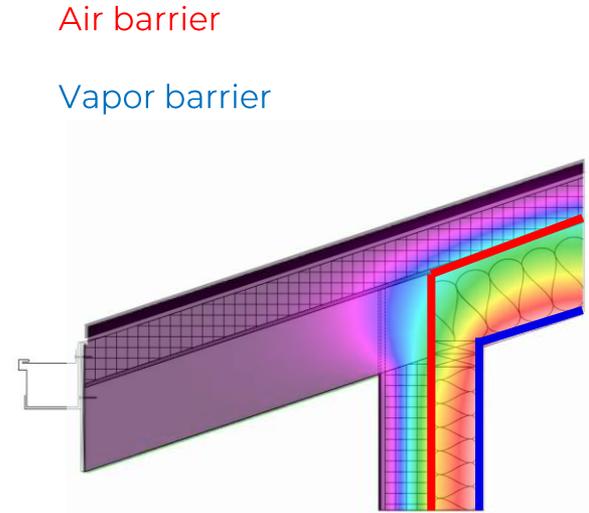
Minimalistic
Design



Foundation



Connection Between Floors

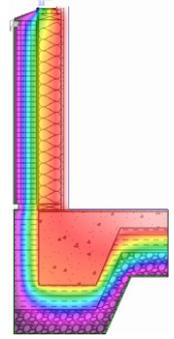
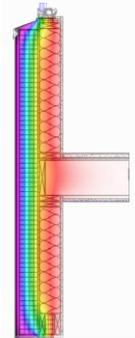
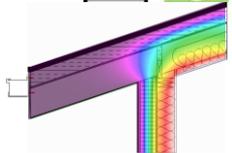


Roof Edge

Air barrier

Vapor barrier

- 0-25° F
- 25-37° F
- 37-50° F
- 50-70° F





SANCO₂ GEN₃ Specifications

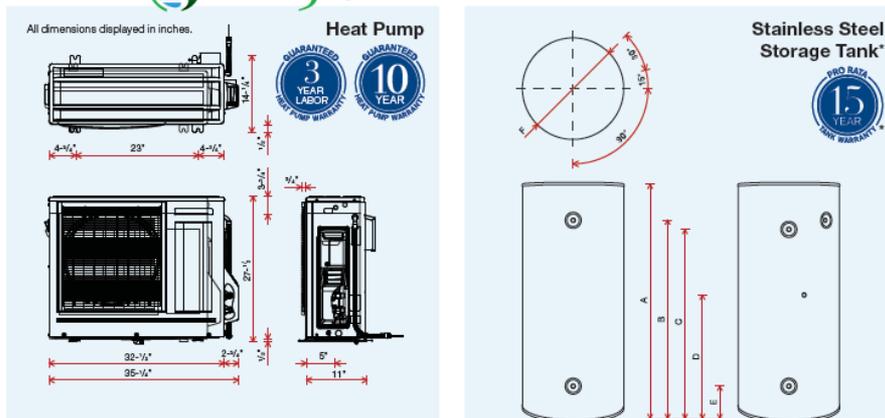


Fig. 8. SANDEN. n.d.

Heat Pump Information		Storage Tank Information	
Uniform energy factor	3.23	Tank capacity	119 Gallons
First hour rating	130 gallons	Warranty	10 Years
Heat pump capacity	15,400 Btu/h		
Heat pump capacity	4.5kW		
Refrigerant type	R744 (CO ₂)		
Outdoor noise level	37dB		



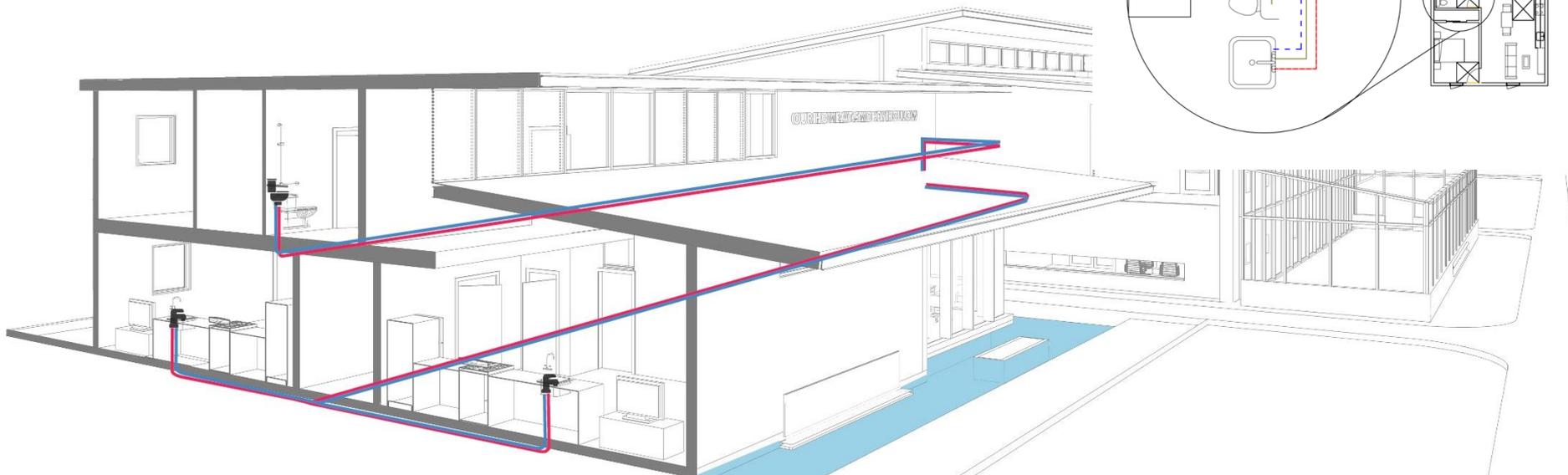
Durable
Materials



Passive
Design



Minimalistic
Design



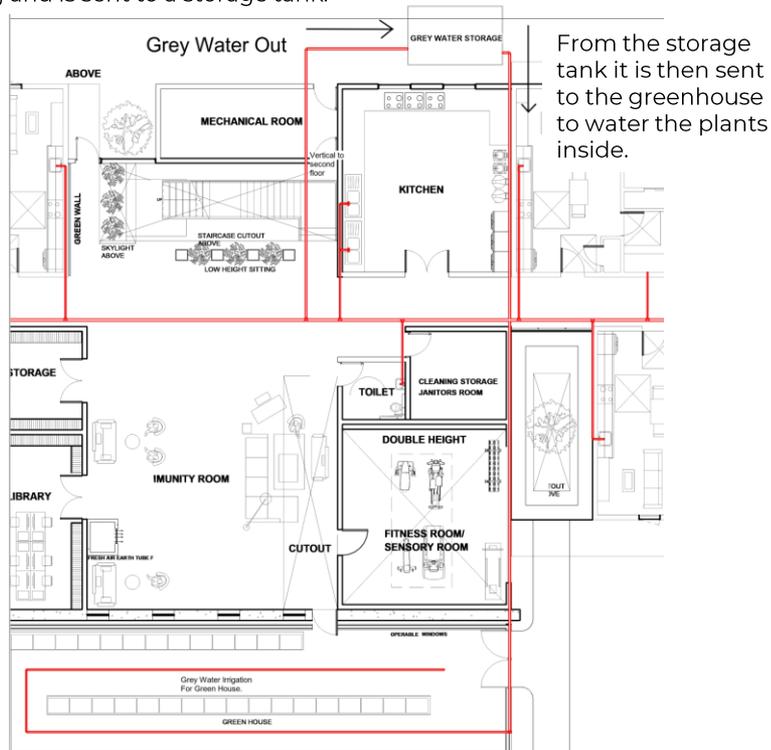
MEP DESIGN

ENGINEERING



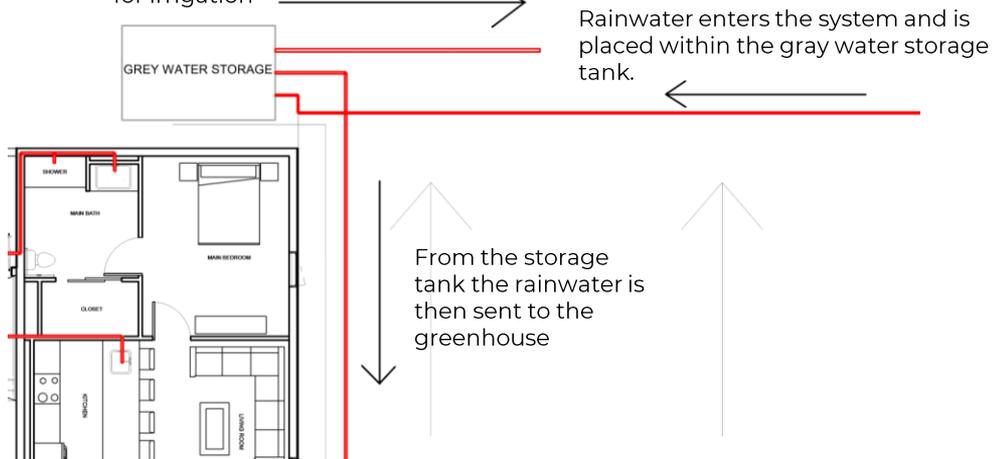
1st floor grey water implementation

Grey water enters the system from the building and is sent to a storage tank.



2nd floor rain water collection

If there is excess rain/grey water left in the system, it may be used onsite for irrigation



Water Savings	
Water collected from fixtures	110,000 Gallons
Water collected from rainwater	552,000 Gallons
Total	662,000 Gallons



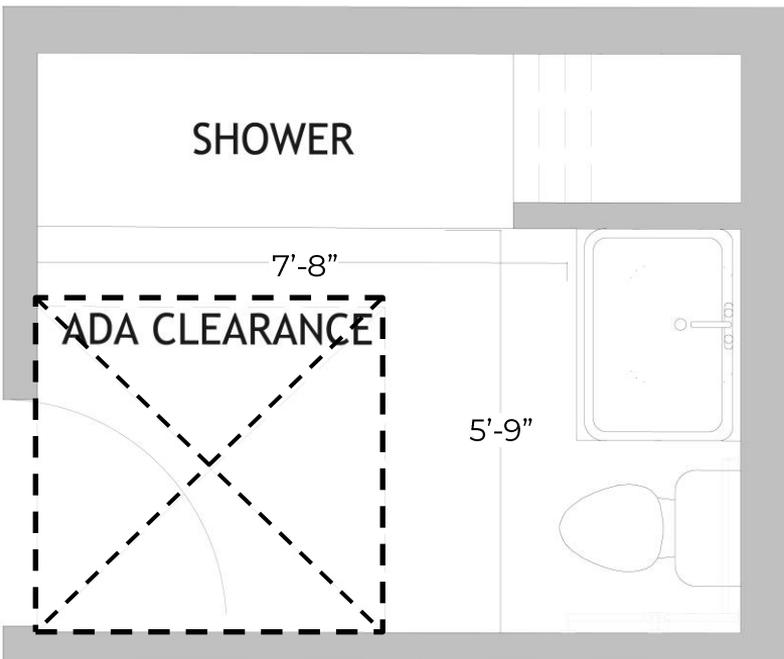
Durable
Materials



Passive
Design



ADA-Int
Layout



MODULAR TOILET DESIGN



Fig. 9. Niagara. n.d.

THE ORIGINAL™

0.8 GPF SINGLE FLUSH TOILET

Elongated Bowl with 12" Rough-In

HEALTHGUARD™

HANDHELD SHOWERHEAD



Fig. 10. Niagara. n.d.

TRI-MAX™

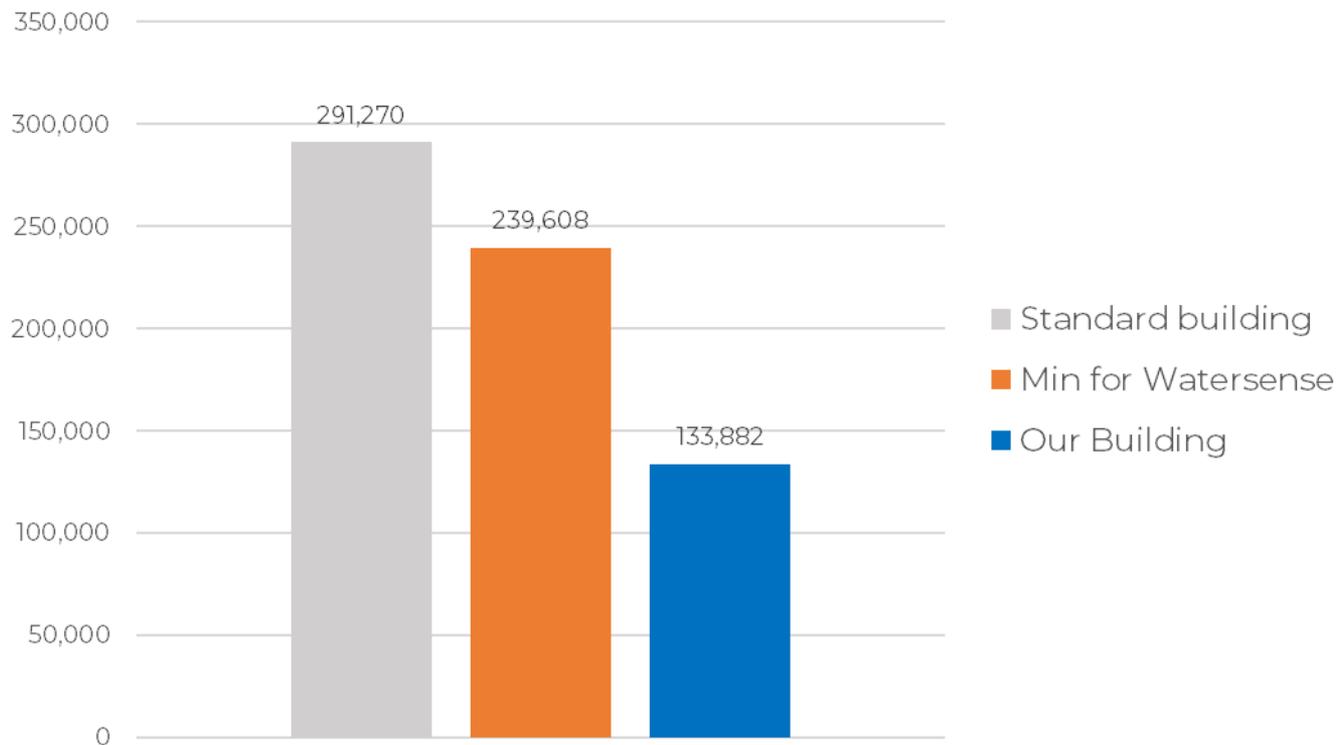
FIXED MOUNT AERATOR



Fig. 11. Niagara. n.d.



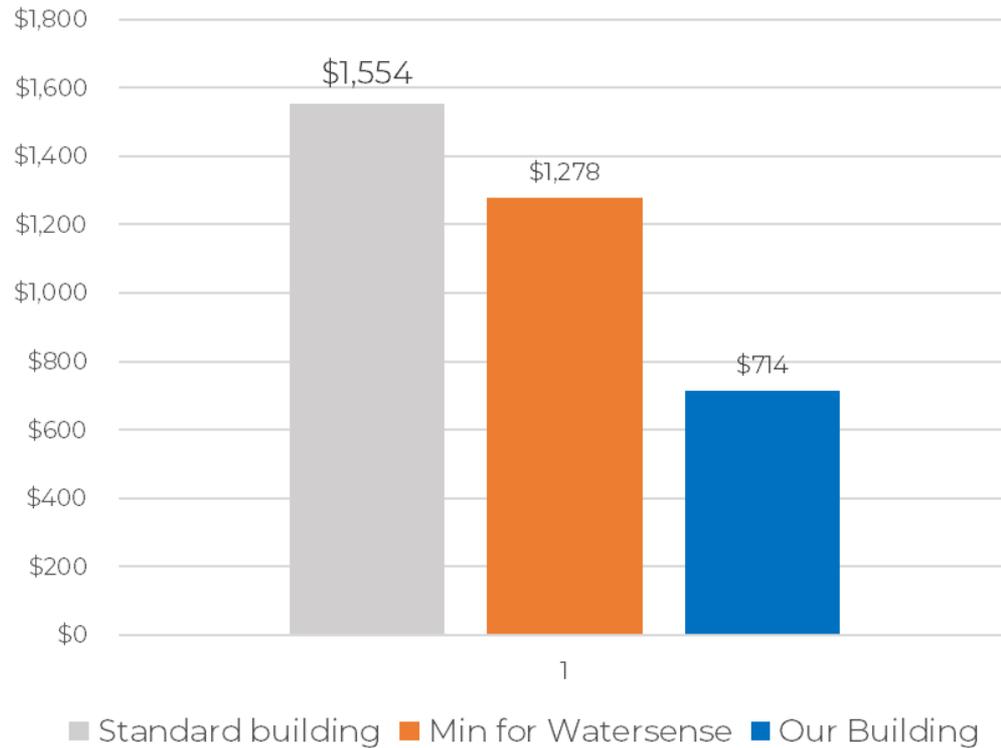
Gallons per year



Saves 45% off EPA's water sense standard.



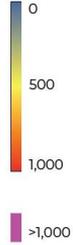
Cost per Year



New York State cost of water
\$3.99/100ft³



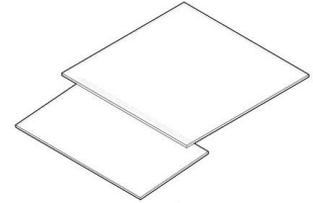
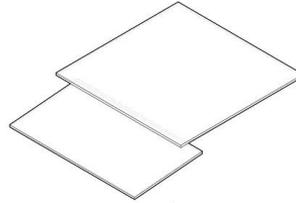
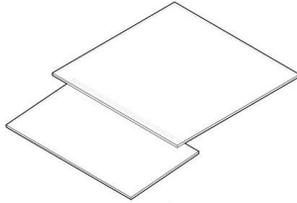
Illuminance (lux)



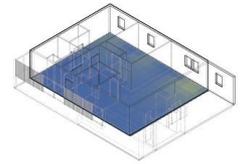
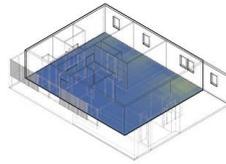
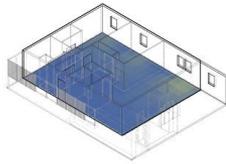
9 am

12 pm

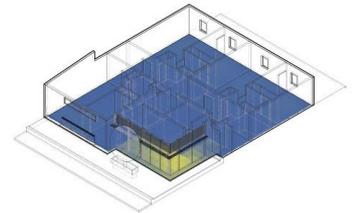
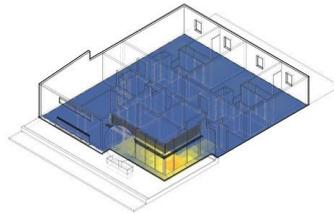
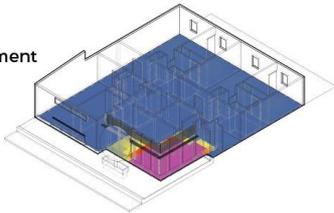
3 pm



2 Bedroom Apartment

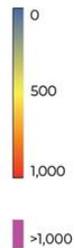


Offices +
1 Bedroom Apartment

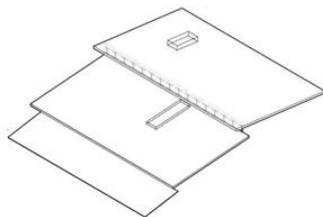




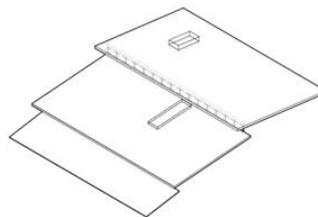
Illuminance (lux)



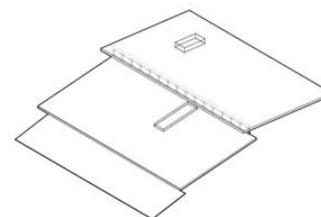
9 am



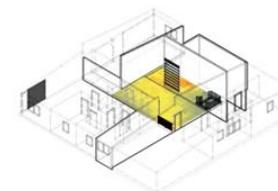
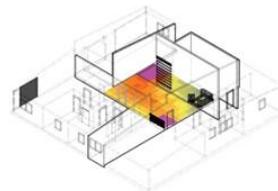
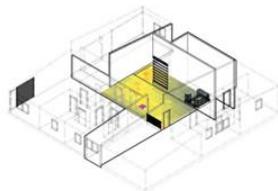
12 pm



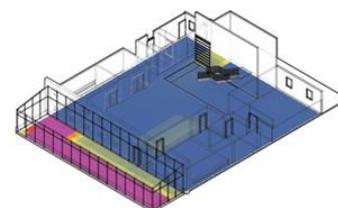
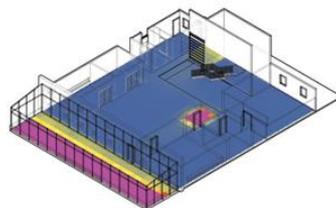
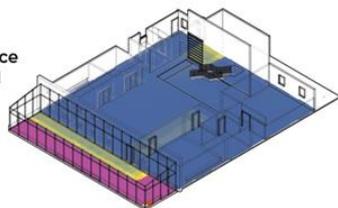
3 pm



Common Space
Upper Level

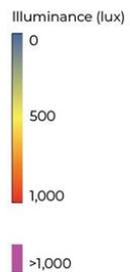


Common Space
Lower Level



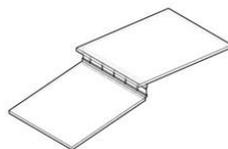
DAYLIGHTING ANALYSIS

ENERGY

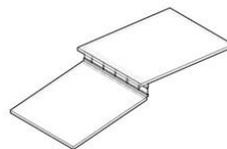


1 Bedroom Apartment

9 am



12 pm



3 pm

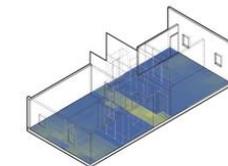
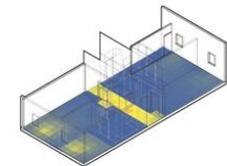
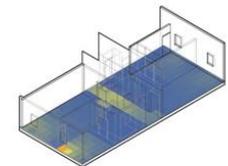
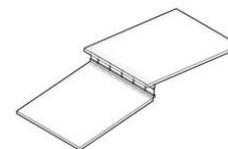




Fig. 12. Brilli. n.d.



Fig. 13. Brilli. n.d.

❖ Optimal Circadian Stimulus

❖ Ultra-Low Flicker

❖ ENERGYSTAR Certified

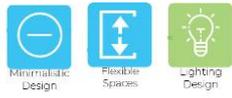
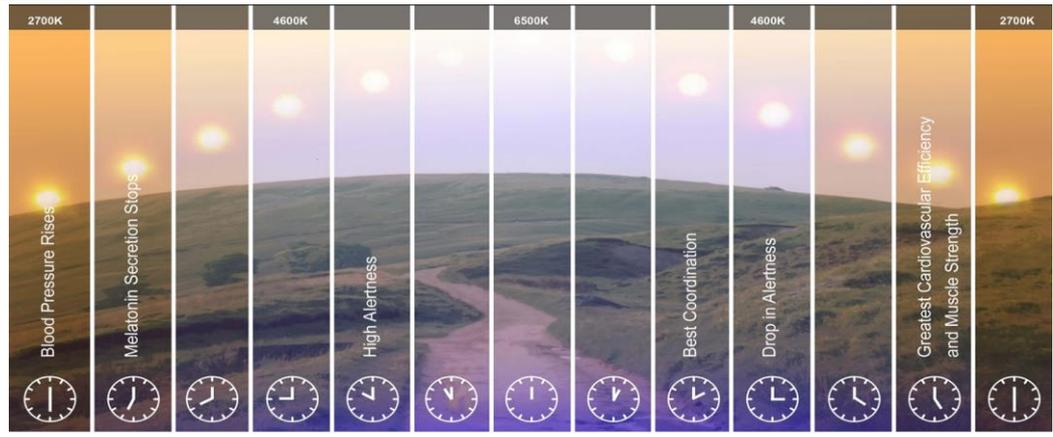


Fig. 14. Energy Star. n.d.

❖ WELL Certified



Fig. 15. WELL Building Institute. n.d.



5000K

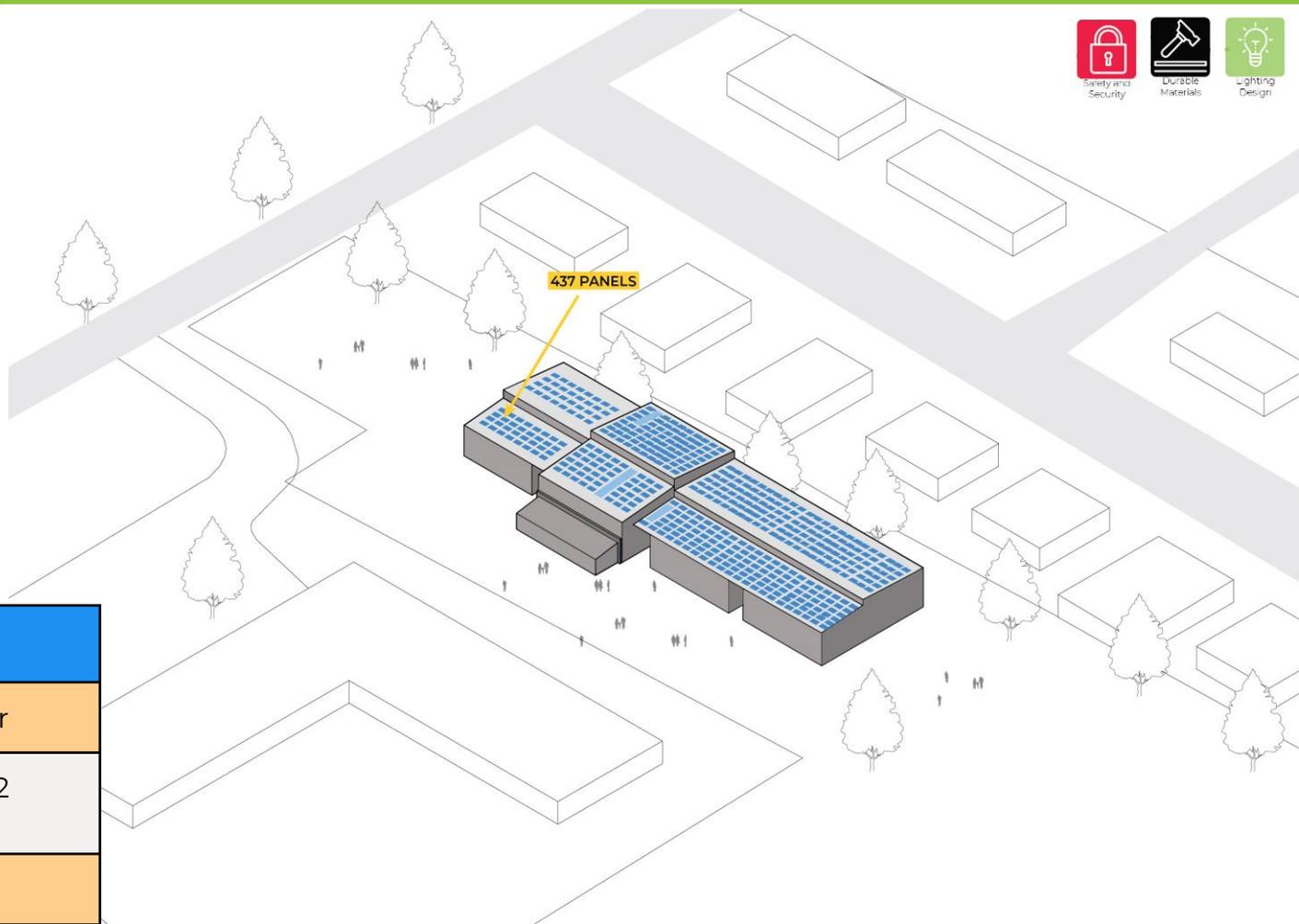
2200K

Fig. 16. Corgan. n.d.



LIGHTING

ENERGY



Roof-top Array Specifications	
Production	214,710 kWh/Year
Panel	Prism Solar BN72 Bifacial
Efficiency	21.2%

SOLAR PV

ENERGY



Net Zero



Durable
Materials



Passive
Design



Fig. 17. Prism Solar. n.d.

72-Cell Bifacial Series 370W



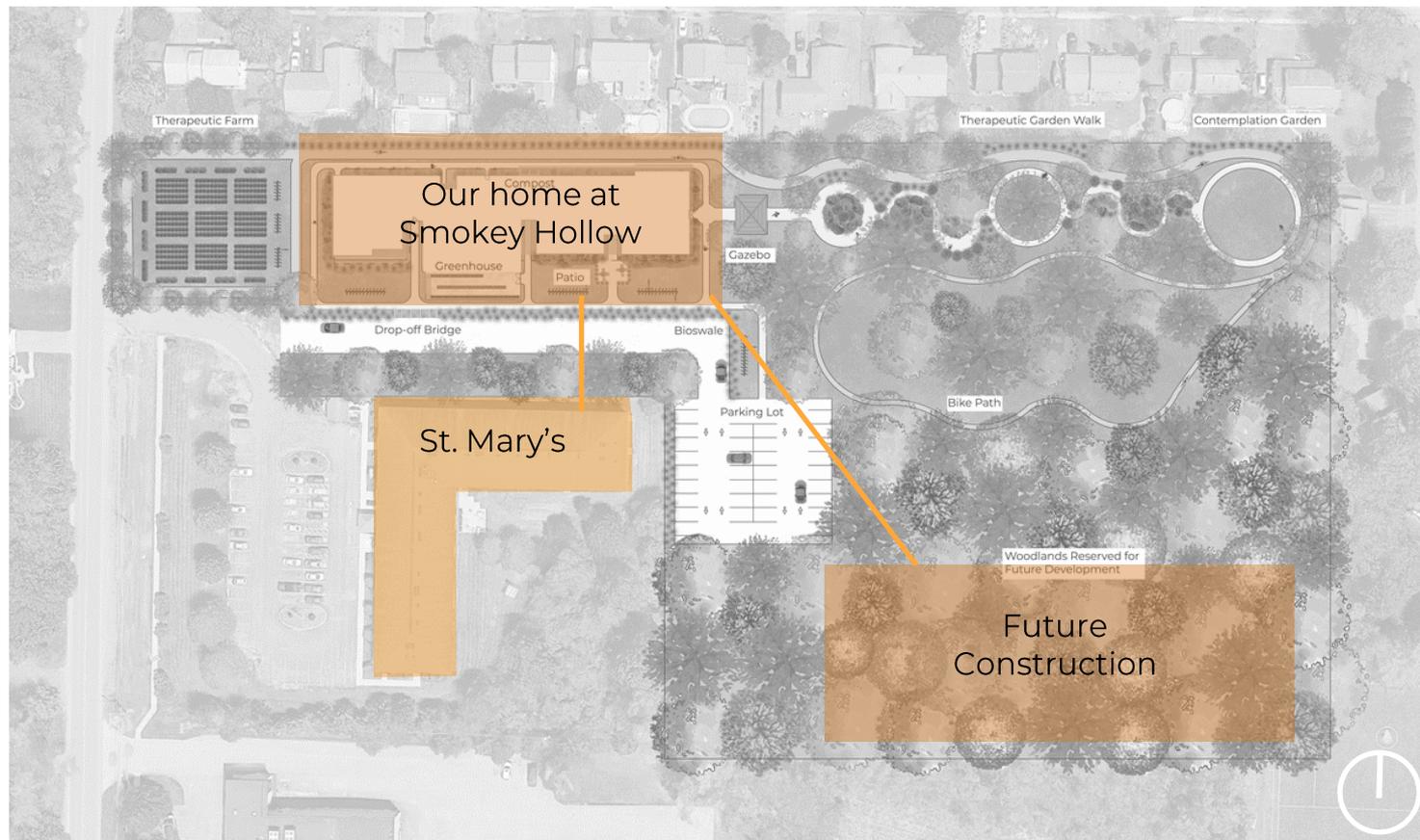
Fig. 18. Prism Solar. n.d.



Net Zero

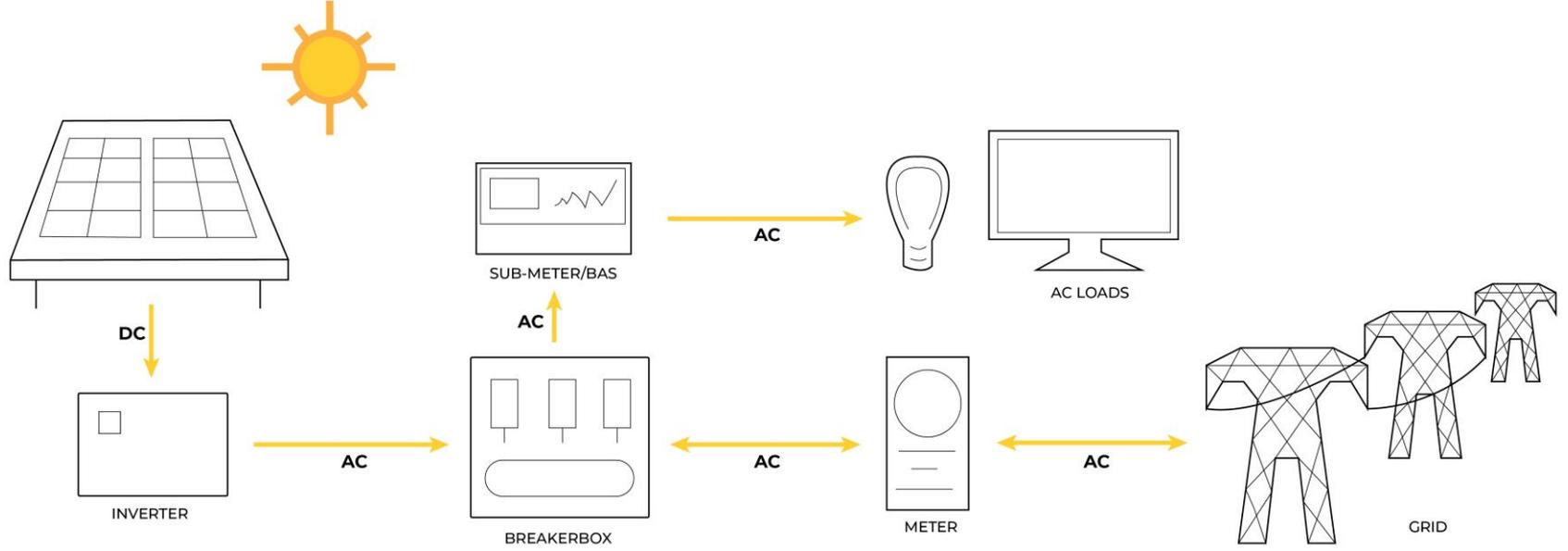
Safety and Security

Efficiency



GRID INTERACTION

ENERGY



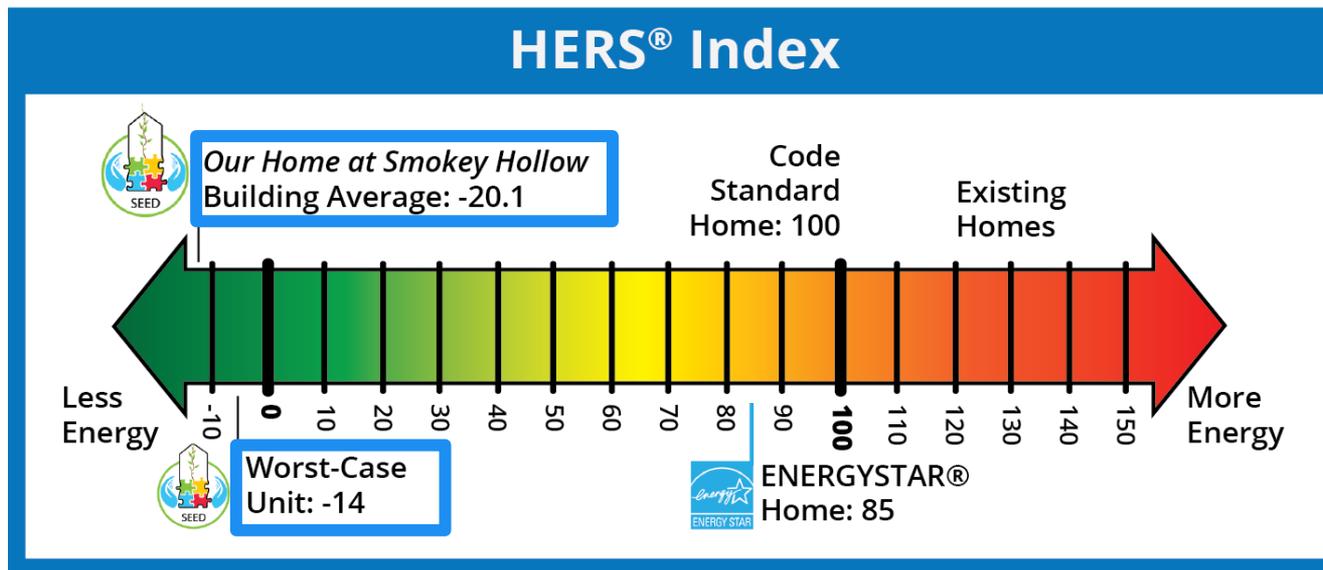


Net Zero

Passive Design

Efficiency

HERS[®] Index





Unit Type	Number of units	HERS Index Without PV	HERS Index With PV	Heating Load MMBtu/yr	Cooling Load MMBtu/Yr	Annual Utility Without PV	Annual Utility With PV
1 Bedroom Middle	8	39	-16	5.5	0.2	\$566.00	\$0.00
1 Bedroom Corner	3	37	-14	6.0	0.2	\$578.00	\$0.00
2 Bedroom Middle	1	41	-34	6.5	0.3	\$803.00	\$0.00
2 Bedroom Corner	3	39	-31	7.1	0.3	\$819.00	\$0.00
2 Bedroom Long	1	38	-24	6.9	0.3	\$766.00	\$0.00
Average		38.69	-20.06	6.4	0.3	\$706.40	\$0.00



Honeywell Building Integration

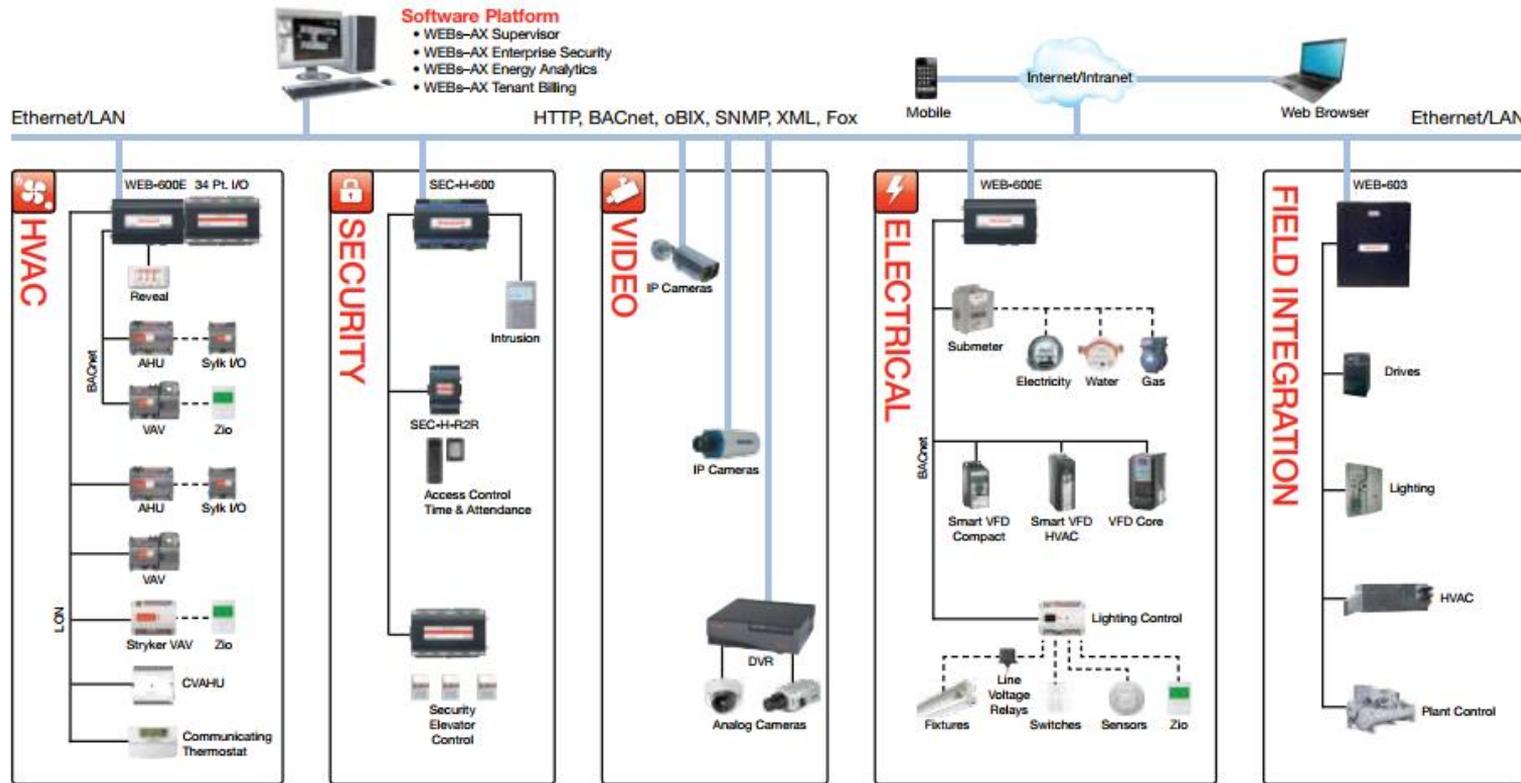
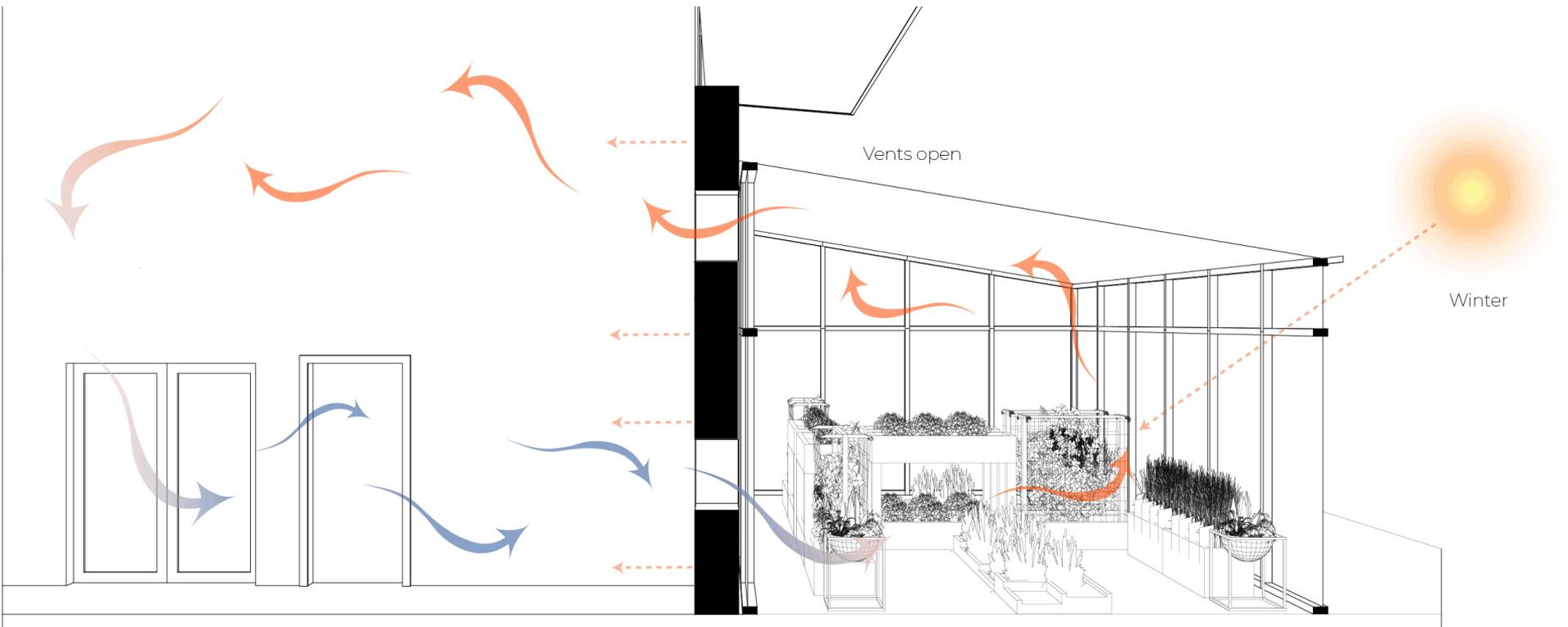


Fig. 19. Honeywell. n.d.





Technology	Model	Specific Use
Building Automation System	WEB's-AX system	Allows all systems in our building to be connected and work in unison to achieve the ideal environment for our residents.
Lighting System	Brilli	Self-adjusting lighting system that changes based on external factors and preset contingencies through the BAS.
Life Safety Alert System	Kidde Smoke Detector with Voice Alarm	Life alert system that utilizes less sound and flashing lights to mitigate unnecessary panic caused by ADS.



Kidde Voice Alert Smoke and CO Alarm



Fig. 20. Home Depot. n.d.

Bed Shaker Alarm



Fig. 21. Harris Communications. n.d.



Efficiency



Minimalistic
Design



AB3A H-T
Layout

Lux Kono Smart thermostat



Fig. 22. LUX. n.d.

Insignia Bottom-Freezer Refrigerator

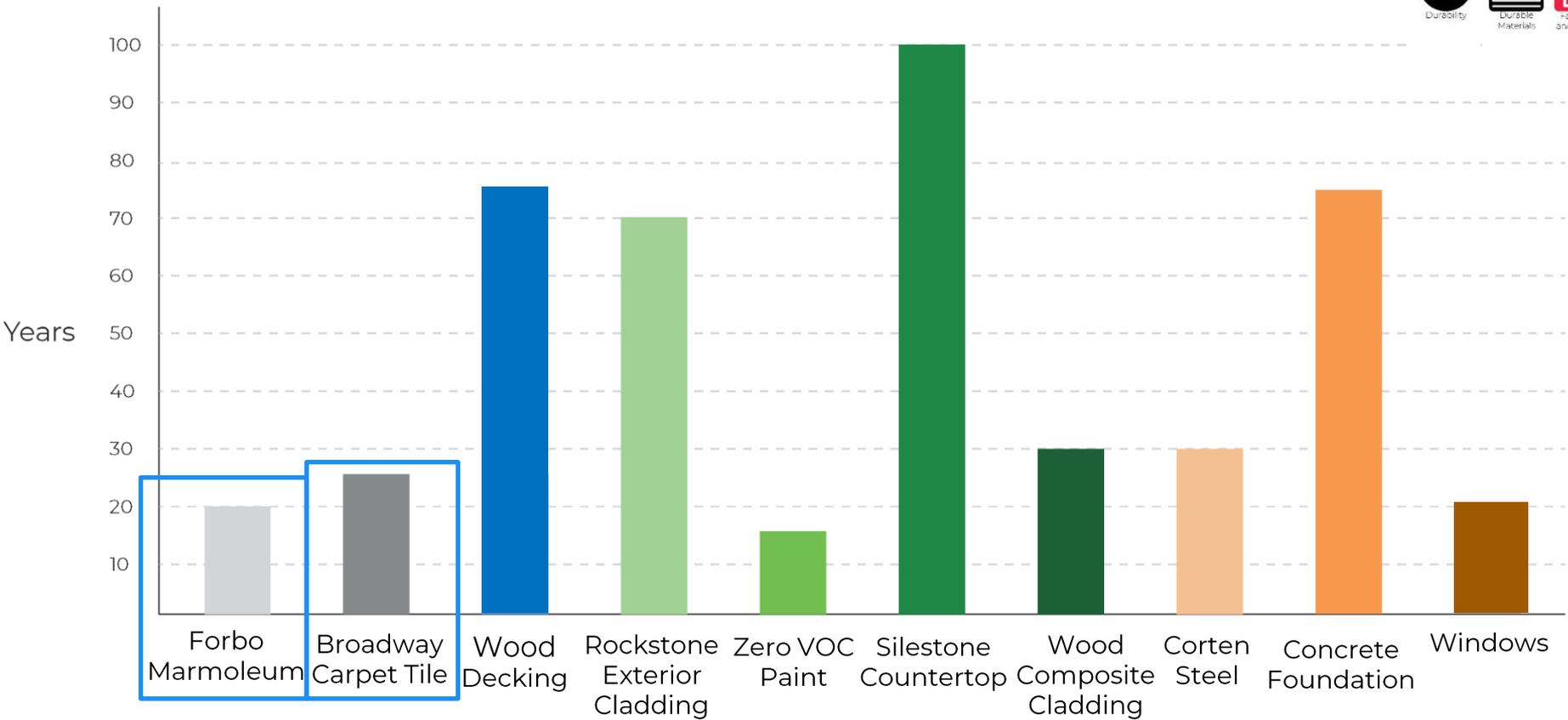


Fig. 23. Best Buy. n.d.

Samsung Clothes Washer



Fig. 24. Energy Star. n.d.



DURABILITY OF MATERIALS

OPERATION

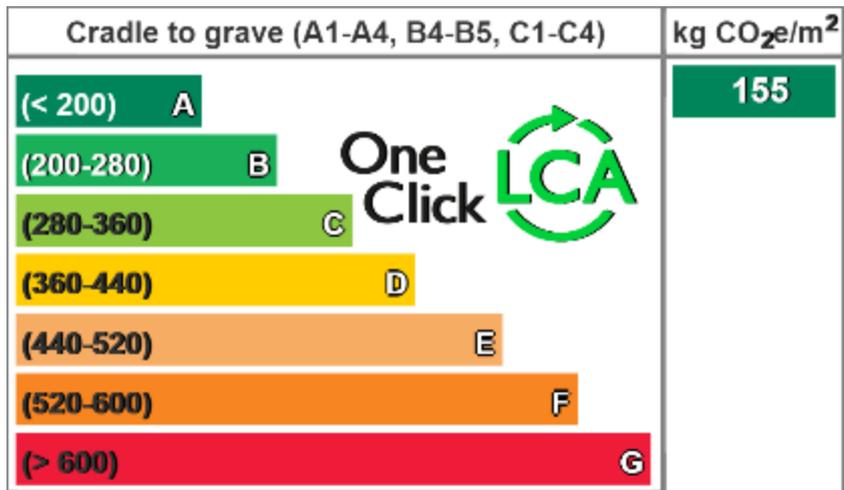
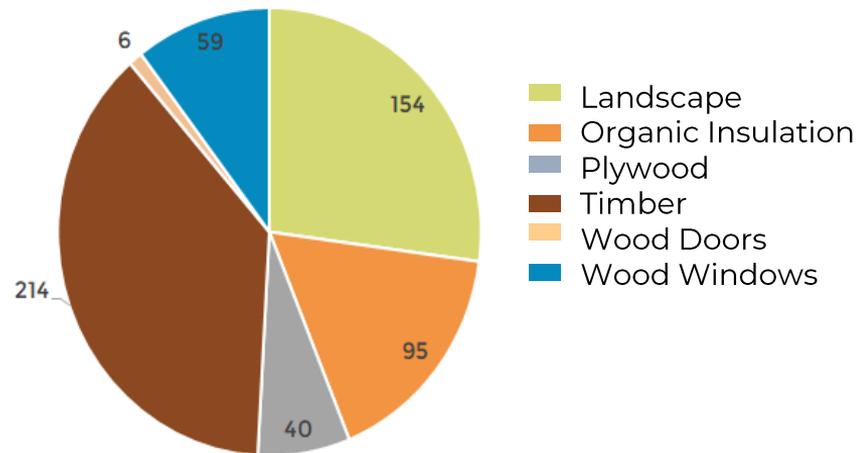


Fig. 25. One-Click LCA. n.d.

Embodied Carbon:

- 410 tons

Sequestered Carbon (tons)



Sequestered Carbon:

- 509 tons sequestered
- Net **-99 tons of CO₂e**



NYSERDA

Fig. 26. NYSERDA. n.d.

Total Incentives	
Low-Rise Residential New Construction Program	\$62,400.00
NY- Sun Megawatt Block	\$63,854
Buildings of Excellence Competition	\$458,250
Total incentives	\$584,504



Minimalistic
Design



Durable
Materials

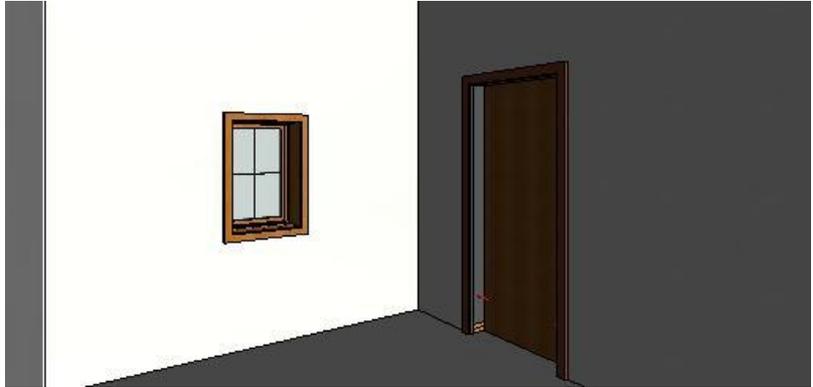


Positive
Design



AUTODESK®
REVIT®

Fig. 27. Autodesk. n.d.



AGACAD

Fig. 28. AGACAD. n.d.

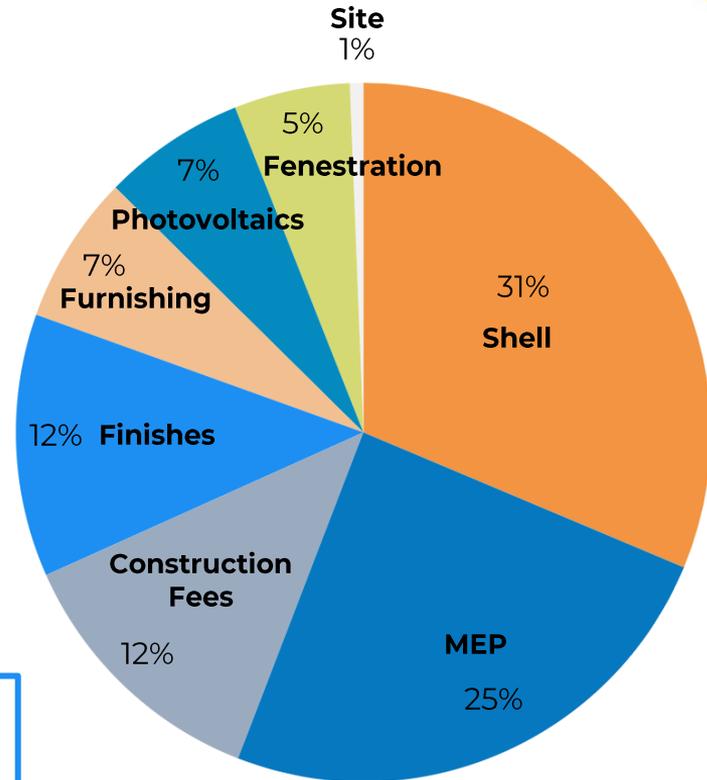




Cost Analysis

- Shell- \$1,940,459
- MEP- \$1,521,935
- Construction Fees- \$770,537
- Finishes- \$753,447
- Furnishings- \$426,889
- Photovoltaics- \$410,490
- Fenestration- \$334,275
- Site- \$38,810

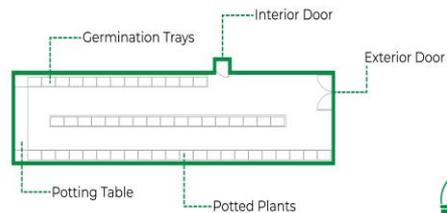
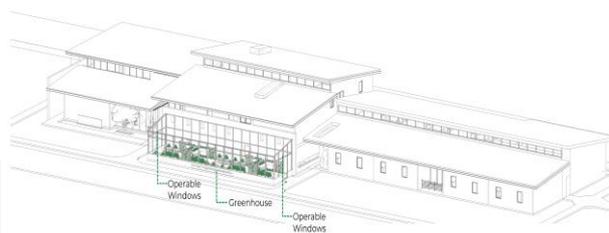
- Estimated Construction Cost: **\$6,196,852**
- About **\$270/sq. ft.**
- Actual Cost: **\$5.9-\$6.8 Million**





Greenhouse Payback:

Greenhouse Size:	1,350	Sq. ft
Greenhouse Cost:	\$54,937	
Harvest Value:	\$8,798	
Harvest Frequency:	3	per year
Annual Value:	\$26,394	per year
Payback:	2.1	years



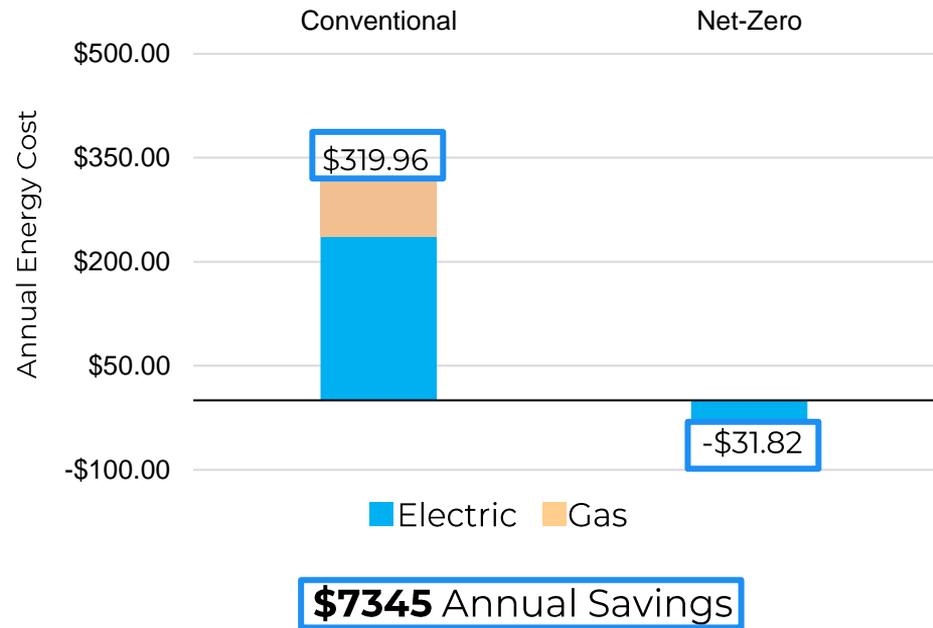


Efficiency

Durable
Materials

Net Zero

Solar Payback:			
Electricity Value:	\$0.18	per kWh	
System Size:	182.44	kW	
System Net Cost:	\$346,636		
Annual Energy:	\$214,710	kWh/year	(Average)
Annual Energy:	205,928	kWh/year	(Low)
Annual Energy:	217,458	kWh/year	(High)
Yearly Value:	\$38,709	per year	(Average)
Payback:	9.0	years	





Efficiency



Durable
Materials



Net Zero

	Conventional Building	Our Home at Smokey Hollow
Construction Costs	\$5,040,640 (\$220/sq. Ft.)	\$6,196,852 (\$270/sq. Ft.)
Payback Period		17 years

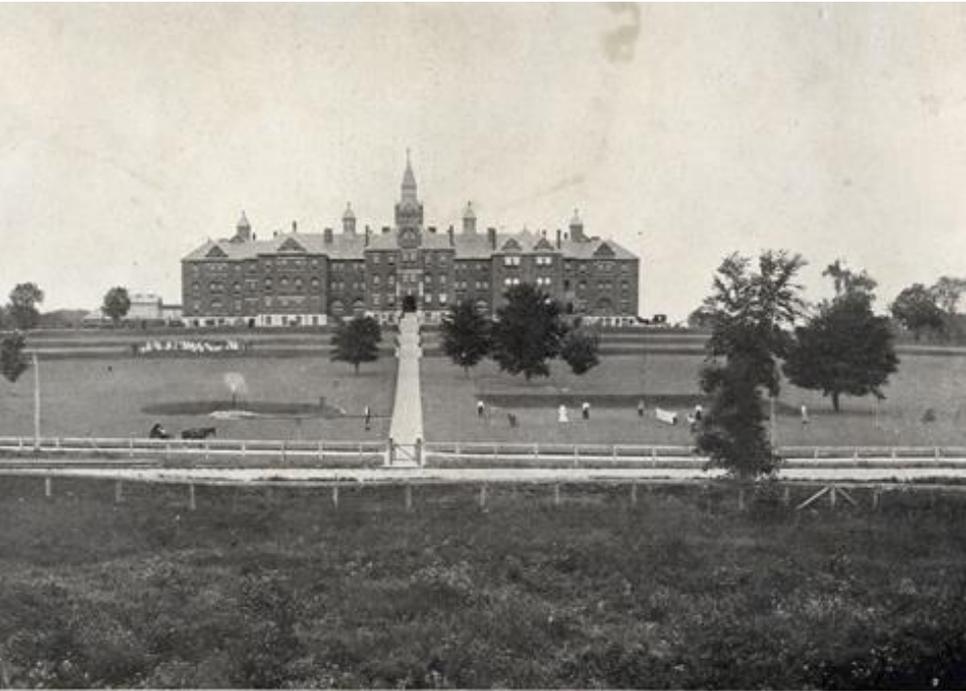


Fig. 29. Archives of Ontario. 1911.



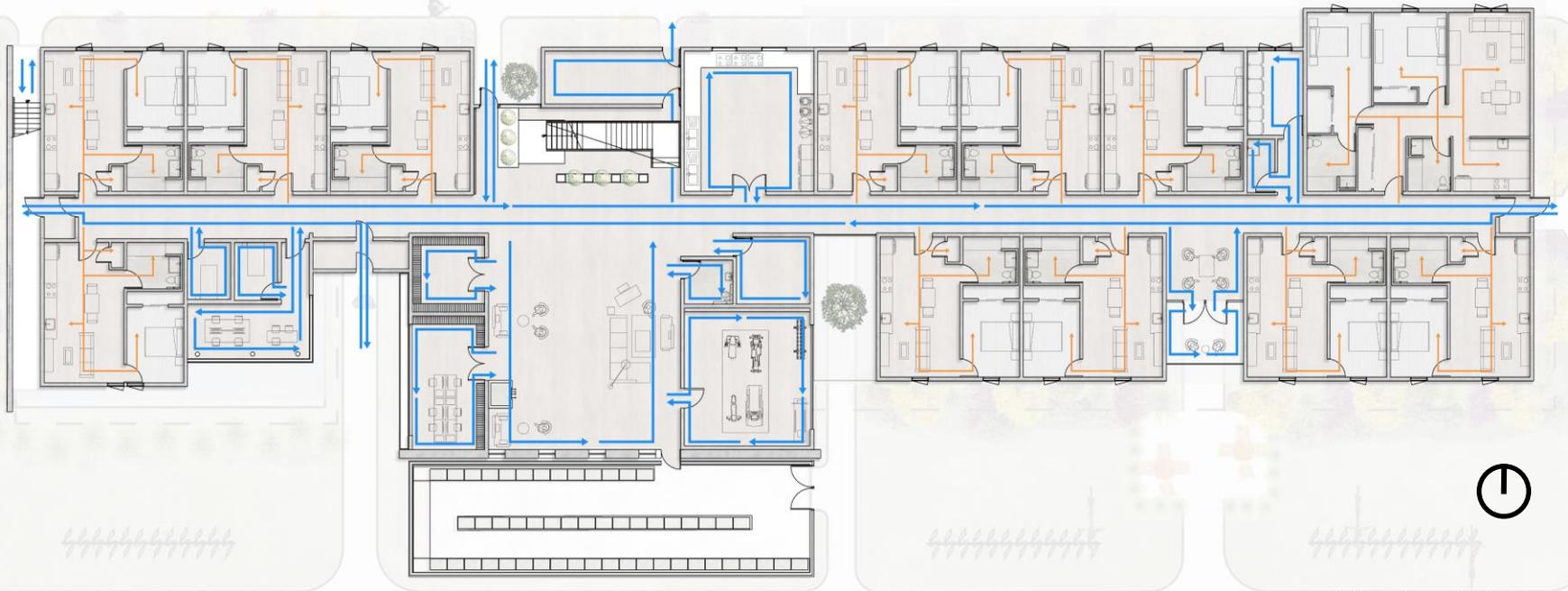
Fig. 30. Geo. 1960.



Our Home At Smokey Hollow



Interior render of Our Home At Smokey Hollow



Public circulation
Private circulation



CIRCULATION

MARKET POTENTIAL



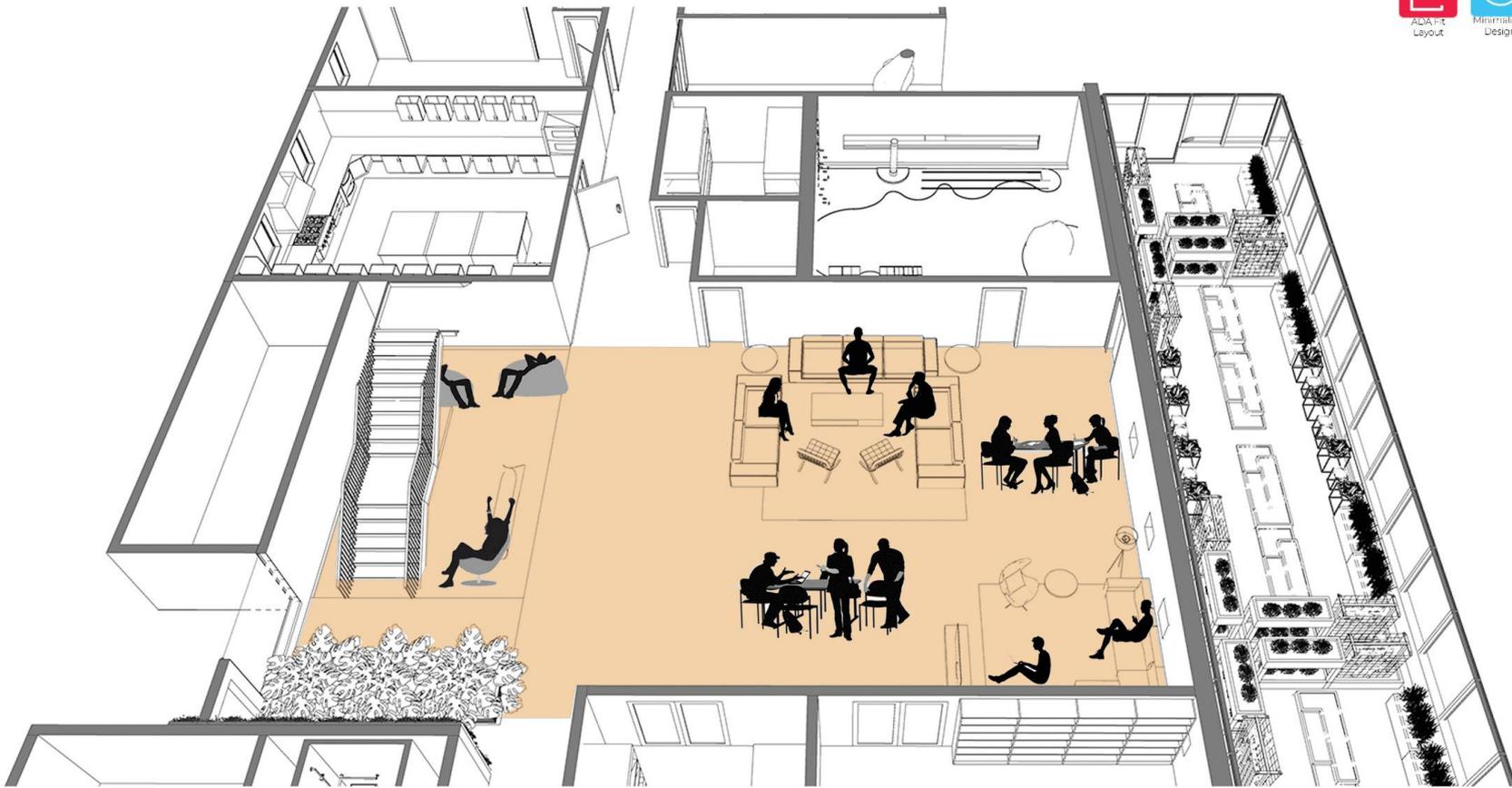
ADA-compliant
Layout



Minimalistic
Design



Choice for
Interaction



FLEXIBLE SPACES

INNOVATION



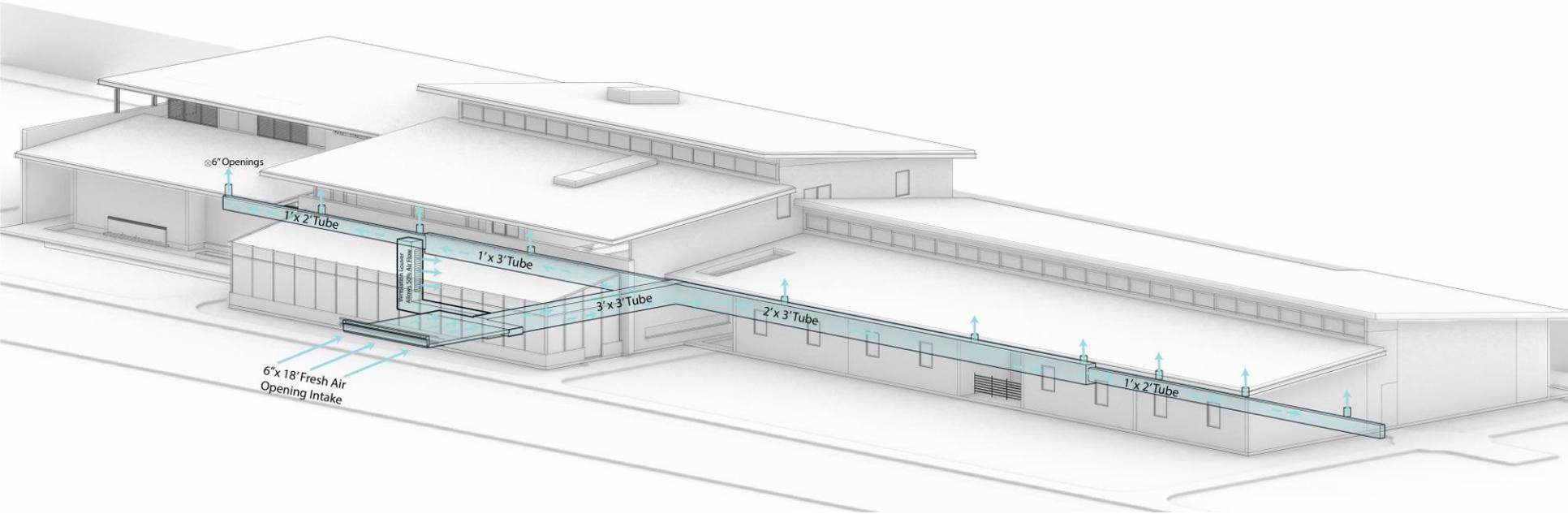
Net Zero



Minimalistic Design



Passive Design



EARTH TUBES

INNOVATION



Net Zero



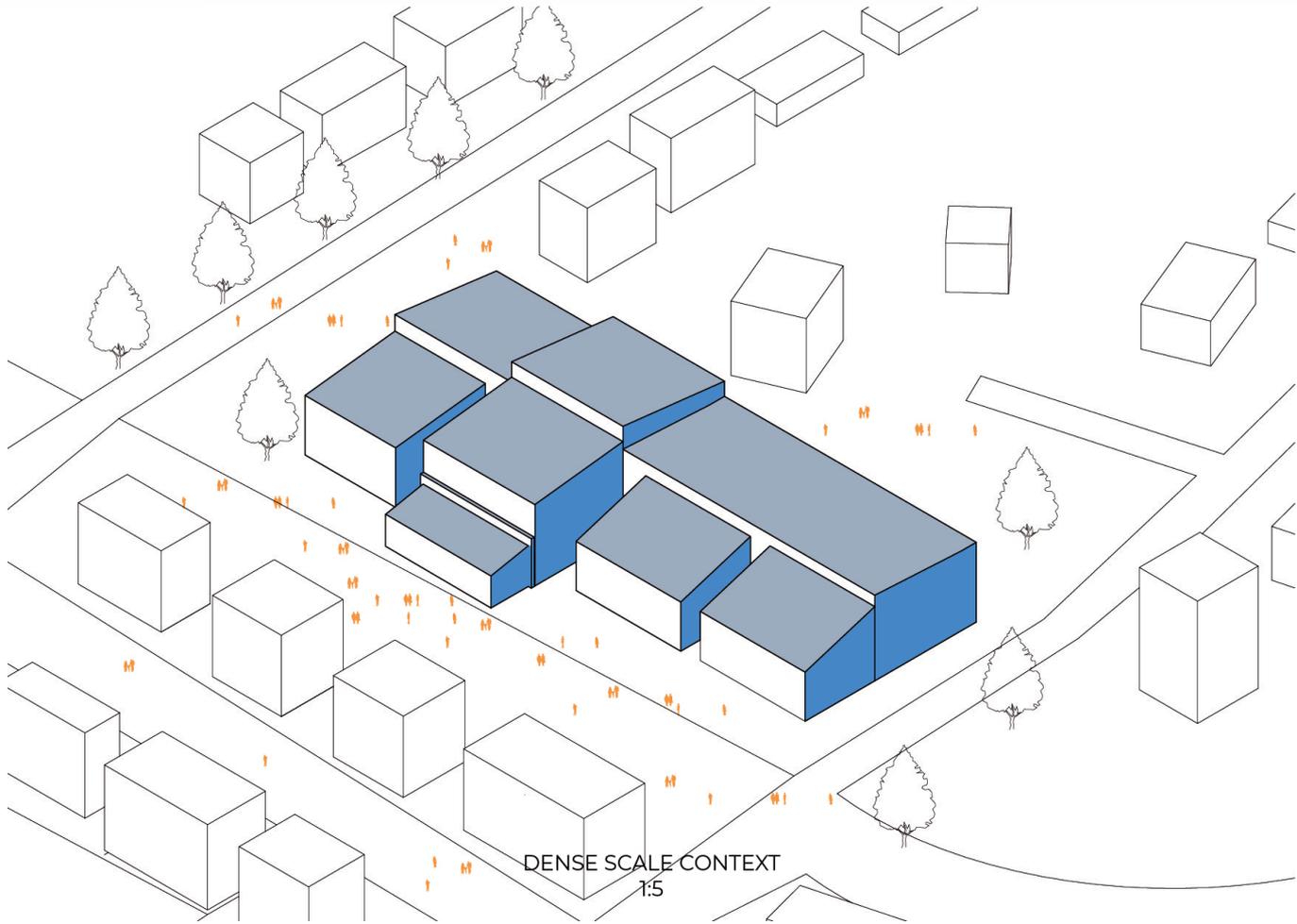
Minimalistic Design



Efficiency

Reclaimed vs. New Furniture





DENSE SCALE CONTEXT
1:5

REPLICABILITY

MARKET POTENTIAL



Fig. 31. Ahrentzen. 2009

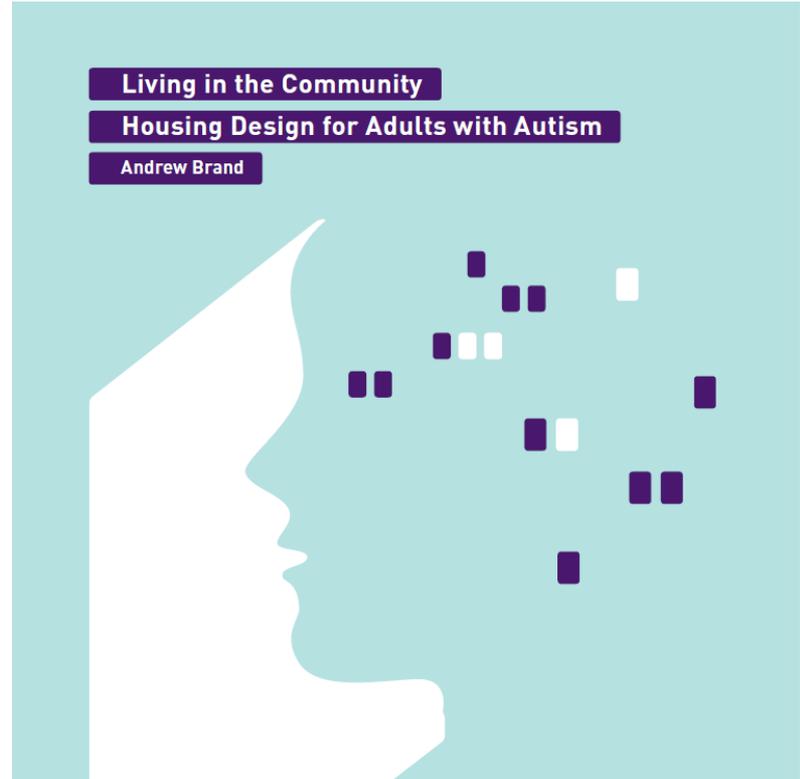
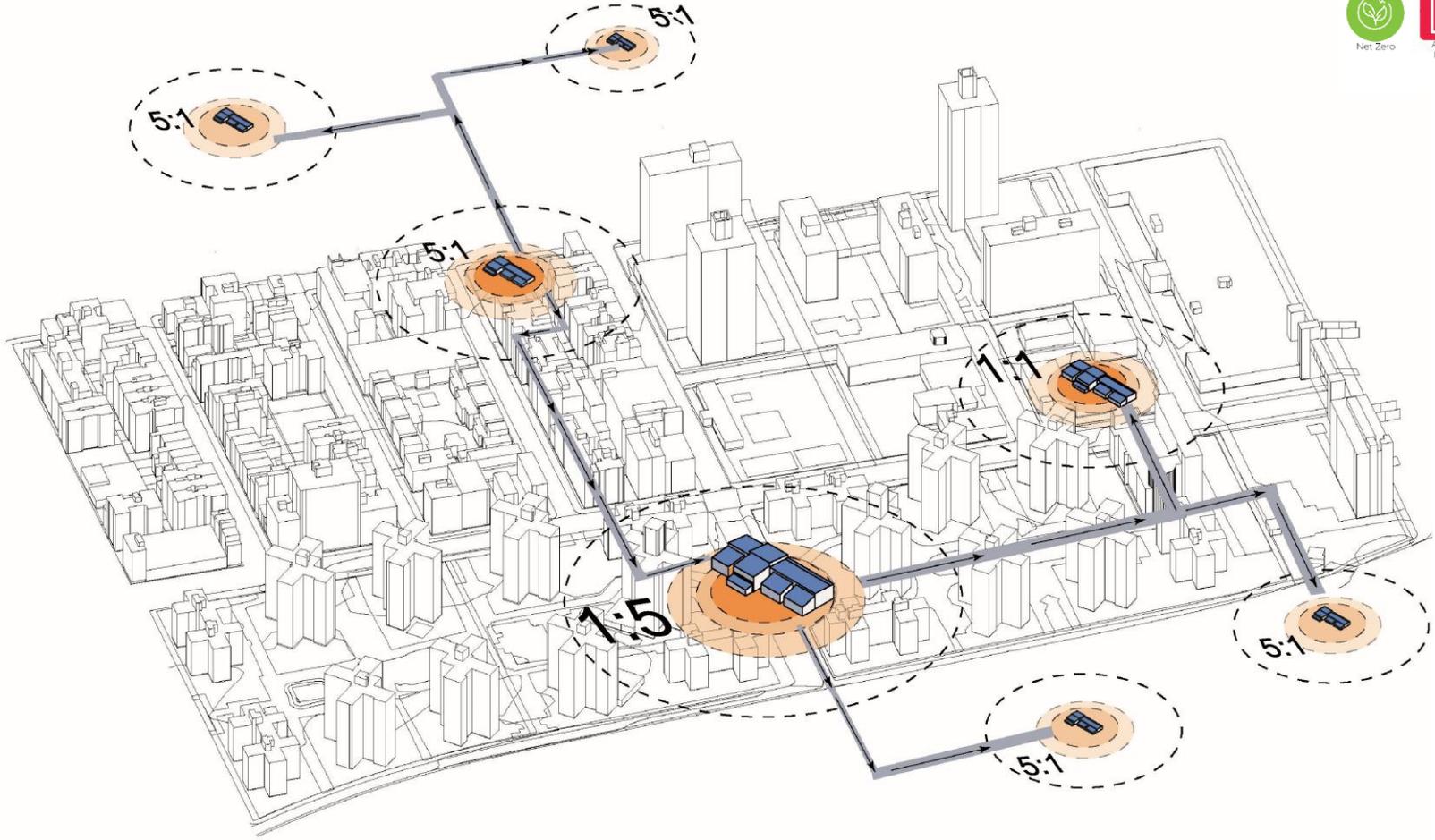


Fig. 32. Brand. 2010.



REPLICABILITY

MARKET POTENTIAL



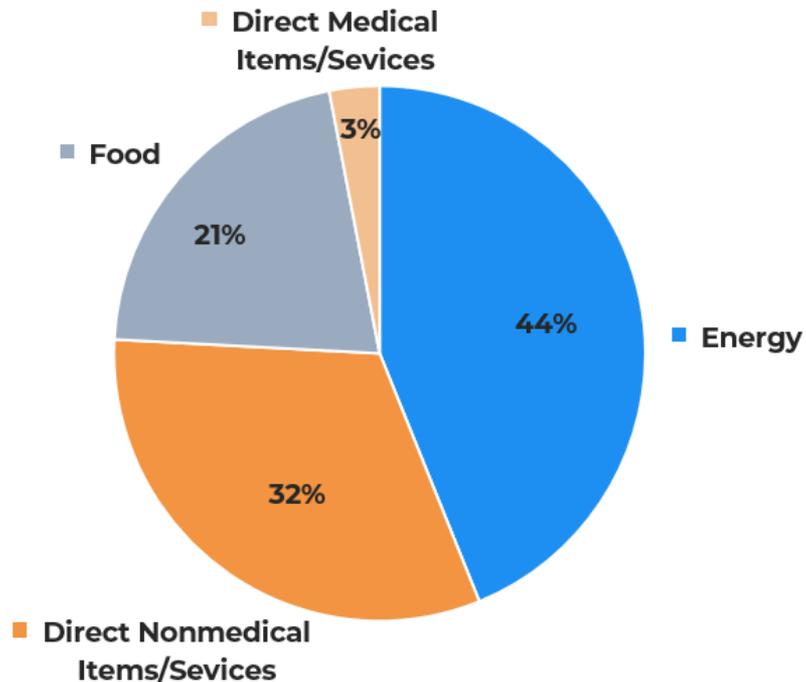
ASD LIFETIME COST OF LIVING

Energy- \$328,619

Direct Nonmedical
Items/Sevices - \$239,306

Food - \$158,178

Direct Medical
Items/Sevices - \$22,826



Total Cost of Living: \$748,929



Net Zero

Efficiency

Sensory safe

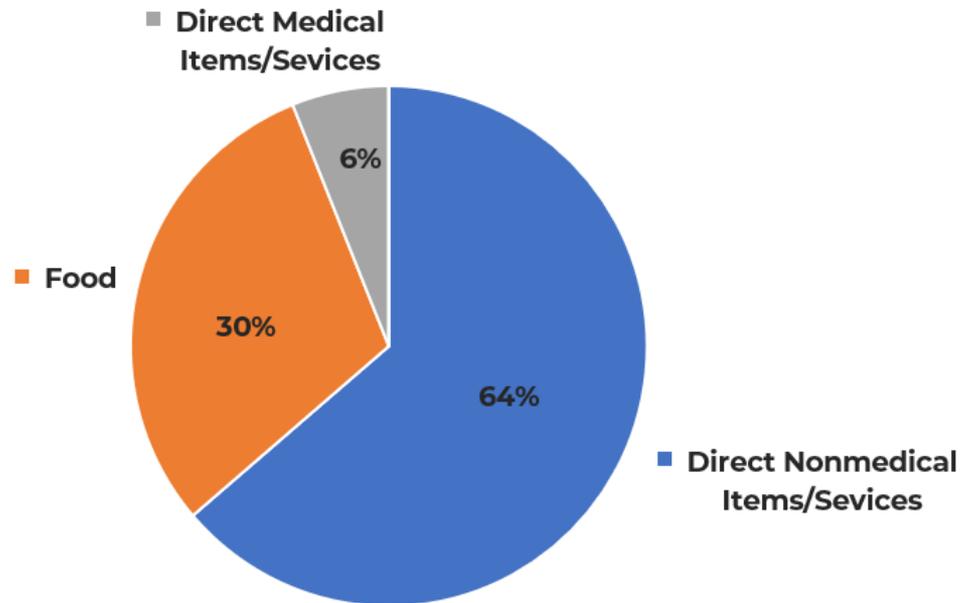
ASD LIFETIME COST OF LIVING AT SMOKEY HOLLOW

■ **Direct Nonmedical Items/Sevices - \$239,306**

■ Food - \$113,435

■ Direct Medical Items/Sevices - \$22,826

■ Energy - \$0



Total Cost of Living: \$375,567



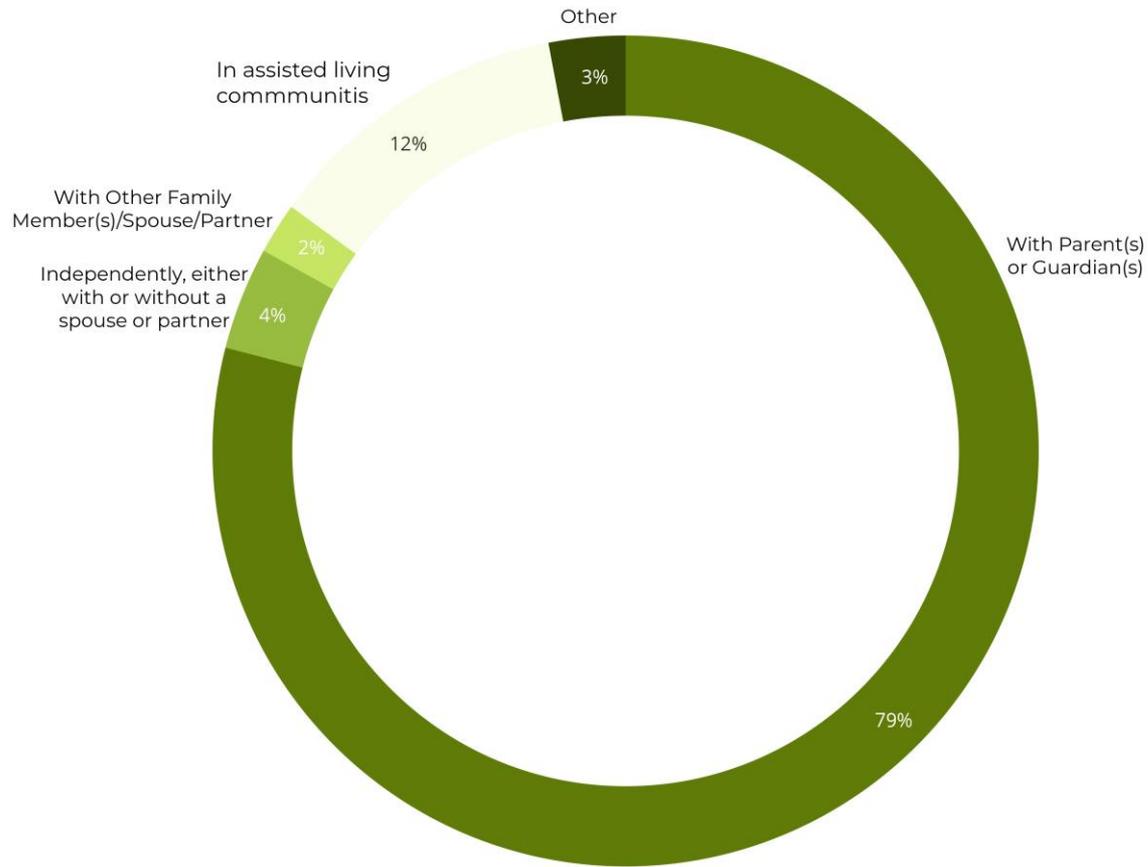
TEAM MEETING THE RESIDENTS



CONCLUSION



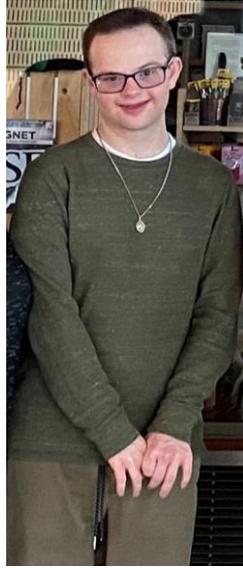
In the United States, 1 in 59 births are diagnosed with autism.



In the United States, almost 90% of people with ASD do not have access to assisted living communities



Maggie



Ian



Nate



Mike







STATE UNIVERSITY OF NEW YORK
COLLEGE OF ENVIRONMENTAL
SCIENCE AND FORESTRY

SYRACUSE UNIVERSITY

OUR HOME AT SMOKEY HOLLOW

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