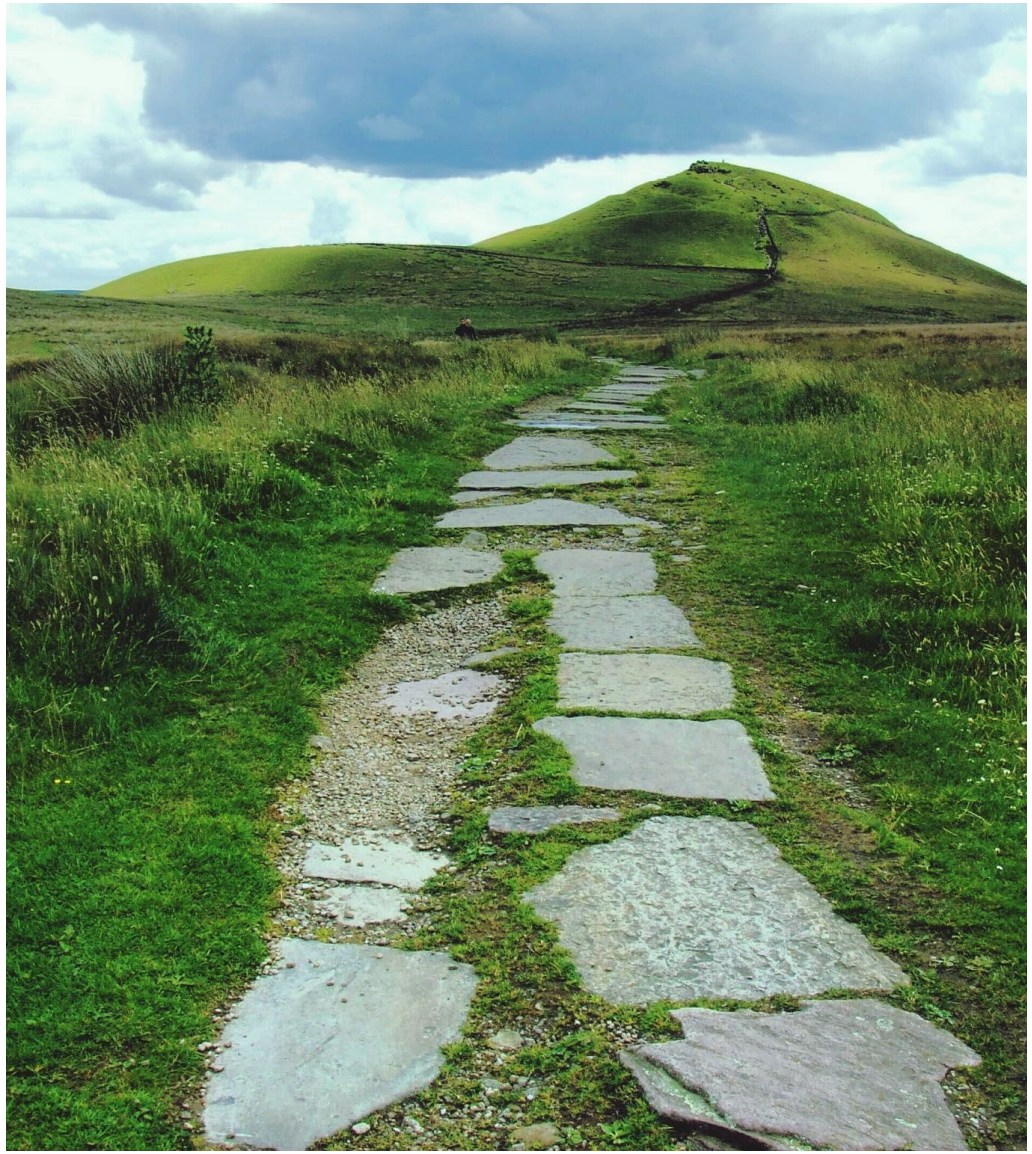
Path to Prescriptive

1. Understand the **cost-benefit equation** for a non-profit developer pursing and achieving Phius-certified construction for nine similar homes in two phases of design and construction
2. Consider whether **Phius Performance or Prescriptive Path** may be best suited for your project by hearing the challenges to certifying projects through the Phius Performance Path for multiple homes, and how Prescriptive Path solves some of these challenges while presenting new ones
3. Explore how Phius **Prescriptive Path impacts project timeline and costs**, from design through construction and certification
4. Come full circle and see **preliminary post occupancy evaluation results**, including energy and indoor air quality data



Who are We?

Elizabeth Turner, CPHC

she/her

- MArch & MS Sustainable Design, University of Minnesota
- BA Religion & Fine Art St. Olaf College
- Architect & CPHC, Precipitate
- (5)/5 Phius (Design) Certified Single Family
- (4)/2 Phius (Design) Certified Multi Family with 3 underway

Who are We?

Azad Lassiter, CPHB he/him

- B.S. Construction Management John Brown University.
- PHL -> MSP
- Real Estate Development Project Manager at Housing In Action (formerly Urban Homeworks)
- General Contractor at High-performance Builders of Minnesota
- 5/7 Phius certified Single family buildings in MN*

WHY is HIA building Passive Houses

HOUSING IN ACTION

https://housinginaction.org/

Who is HIA?

Housing in Action is committed to building a future where safe, stable, and dignified housing is a reality for everyone. By building affordable homeownership opportunities, providing dignified rentals as a foundation for growth, creating accessible pathways to homeownership, and connecting communities to their elected officials, HIA not only seeks to offer relief to neighbors within the current unjust housing system, but create change so our work is no longer needed.

It fulfils our mission

The mission *of Housing In Action is to lead the fight for housing justice so that all people have a safe, stable, and dignified place to live.*

- *Safe*
  - *Passive Homes help us create safer and healthier living spaces.*
    - *Indoor Air Quality, Security, non toxic Materials.*
- *Stable*
  - *Reduced Energy Bills provides lower TCO for 60 -80% AMI Buyers*
- *Dignified*
  - *Our homes are part of the solution for increased climate equity.*

Where did we start?

Funding Priorities

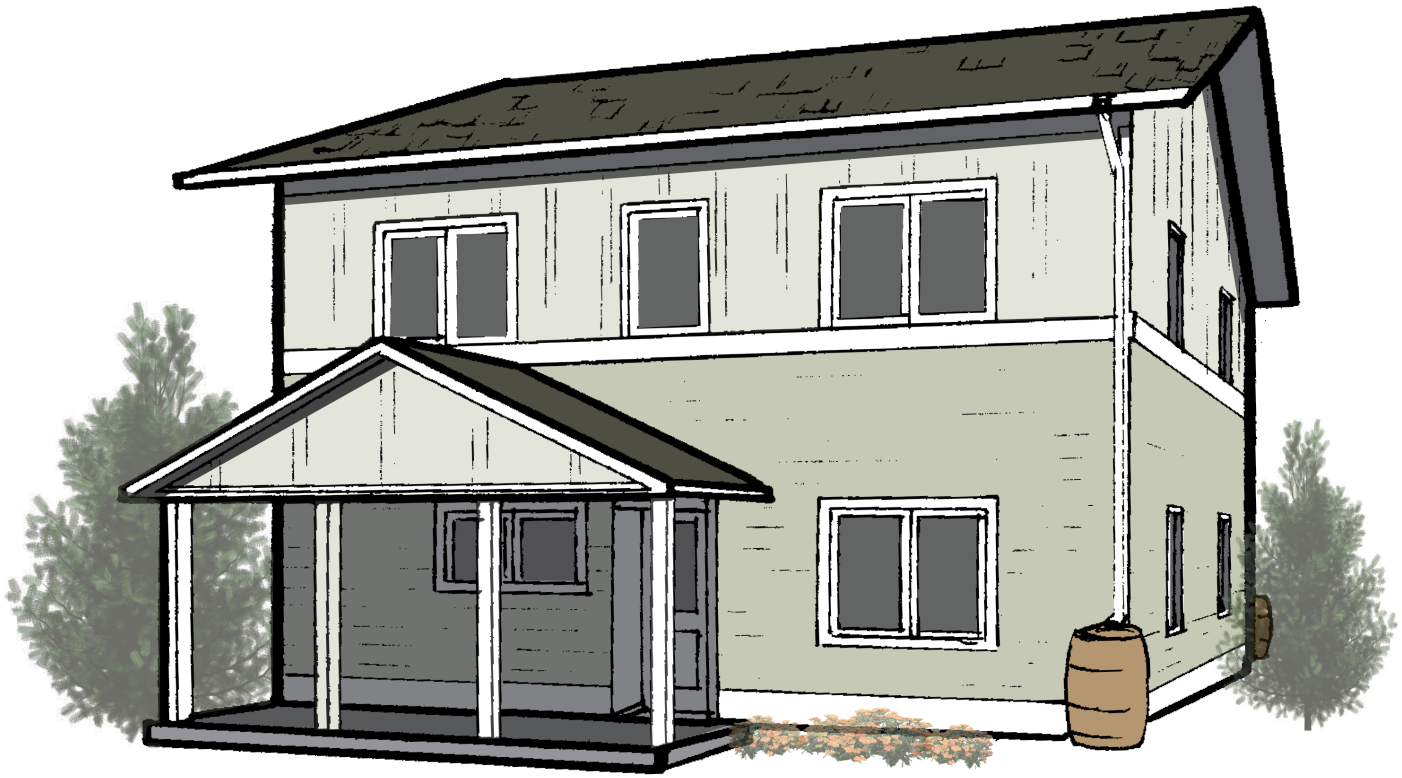
- *City of Minneapolis*
  - *Minneapolis Homes*
  - *Green Cost Share*
  - *Metropolitan Council LHIA*

Project Partners

HELP of Values Aligned Partners

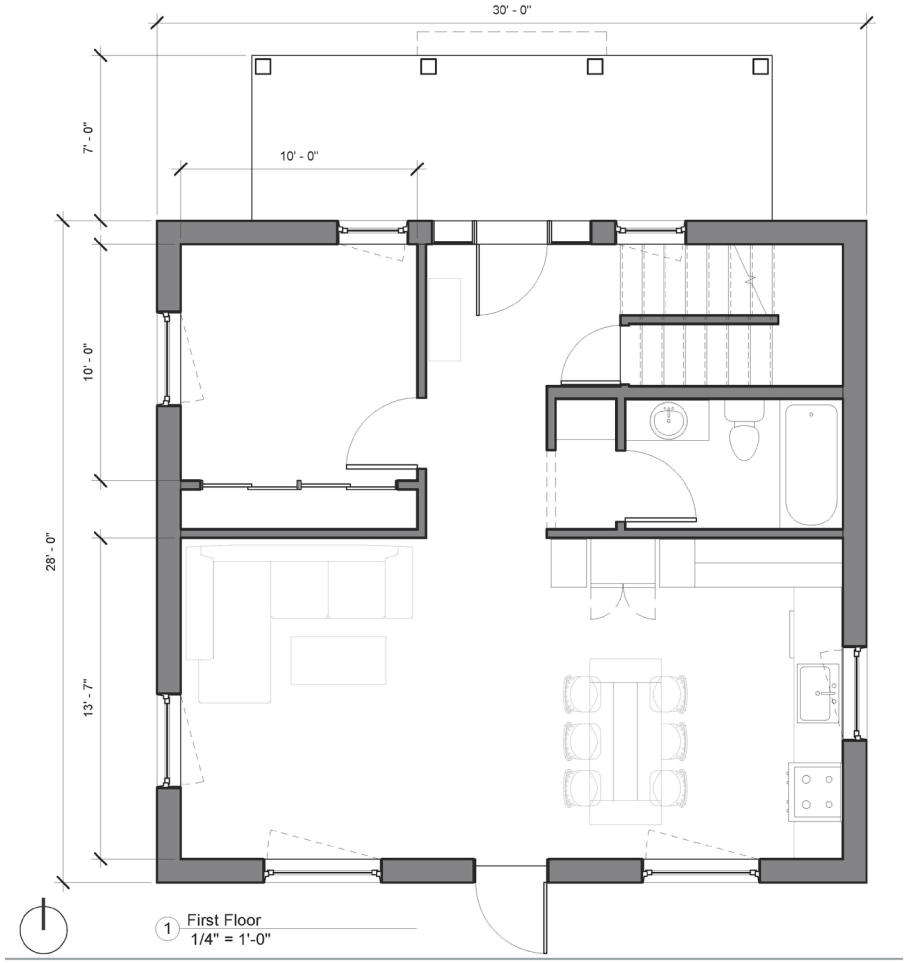
- Precipitate Architecture
  - Elizabeth Turner, AIA, CPHC
  - https://www.precipitatearch.com/
- Center For Energy and Environment
- Local Builders
  - JR Remodelers and Builders
  - The Fortress Project
- Trades
  - Binder Heating and Air Conditioning

Phase 1: Phius CORE 2021

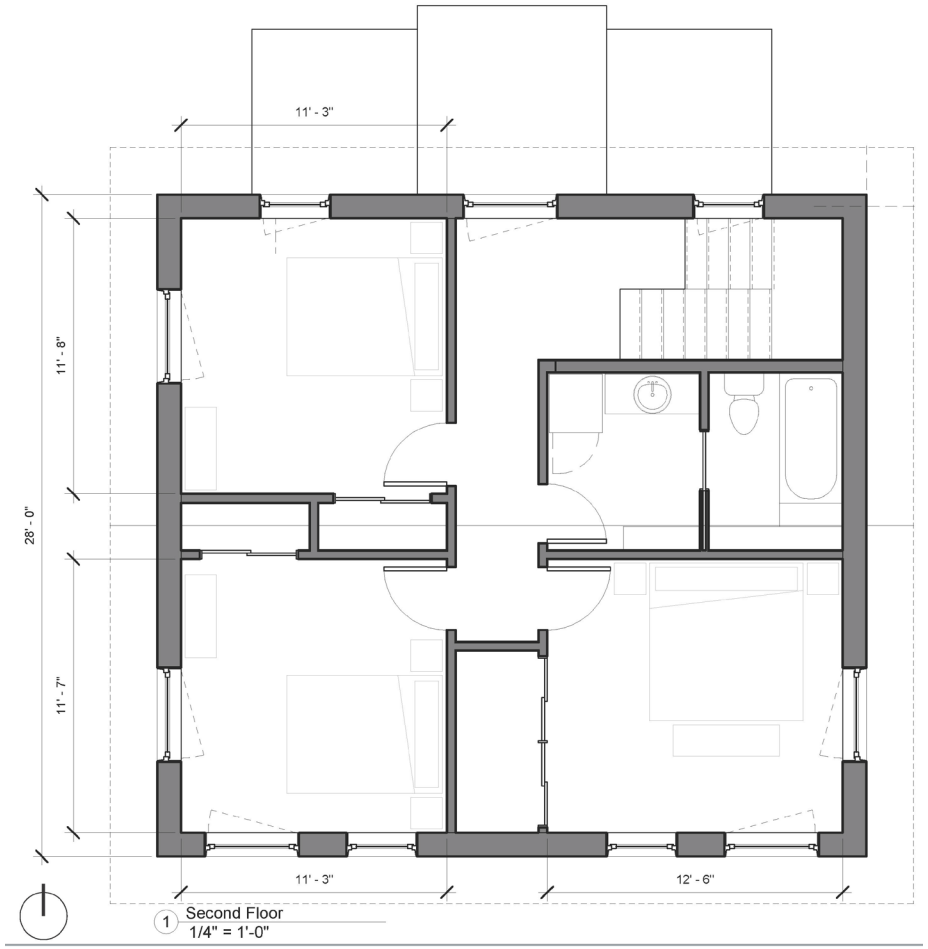


- *4 bedrooms 2 bath (1 bed/bath visitable floor 1)*
- *Living room / kitchen face South with larger windows*
- *Orient roof for future solar*

Phase 1: Phius CORE 2021



FIRST FLOOR



SECOND FLOOR

Phius CORE 2021 Targets

Phius 2021
Performance Criteria Calculator v3.3

UNITS:	IMPERIAL (IP)
BUILDING FUNCTION:	RESIDENTIAL
PROJECT TYPE:	NEW CONSTRUCTION
STATE/ PROVINCE	MINNESOTA
CITY	MINNEAPOLIS-ST PAUL

Envelope Area (ft²)	3,978.4
iCFA (ft²)	1,346.5
Dwelling Units (Count)	1
Total Bedrooms (Count)	4

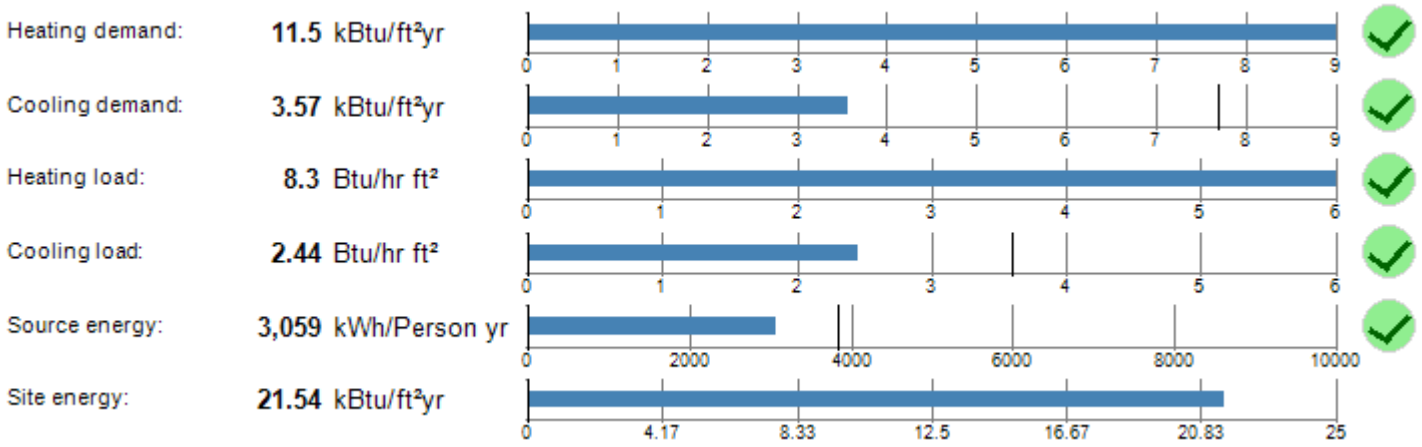
Space Conditioning Criteria

Annual Heating Demand	11.5	kBtu/ft²yr
Annual Cooling Demand	7.7	kBtu/ft²yr
Peak Heating Load	9.3	Btu/ft²hr
Peak Cooling Load	3.6	Btu/ft²hr

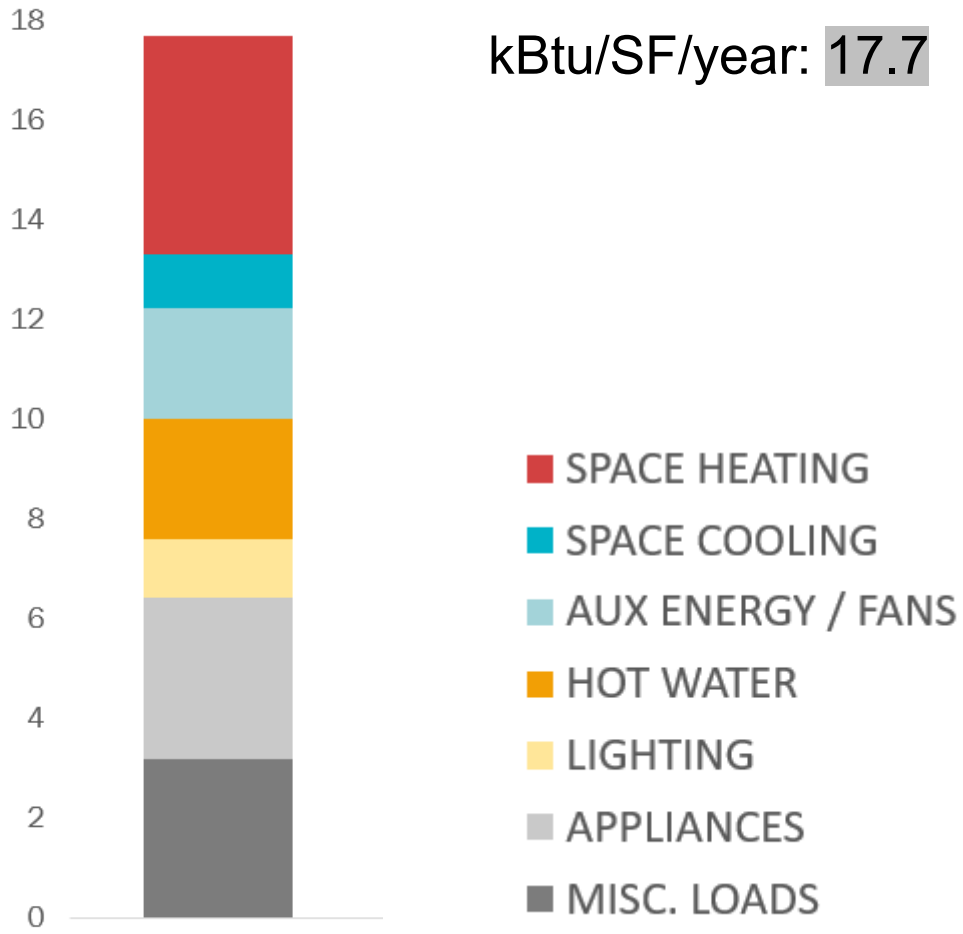
Source Energy Criteria

Phius CORE	3325	kWh/person.yr
Phius ZERO	0	kWh/person.yr

811 31st Targets from Phius (left) and results from WUFI Passive (below)

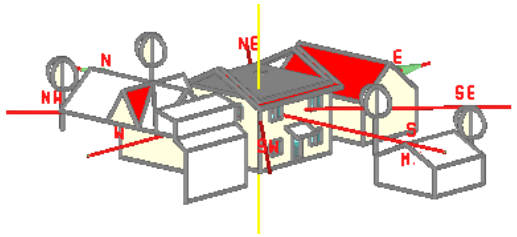


Phius CORE 2021 Modeled Energy Use

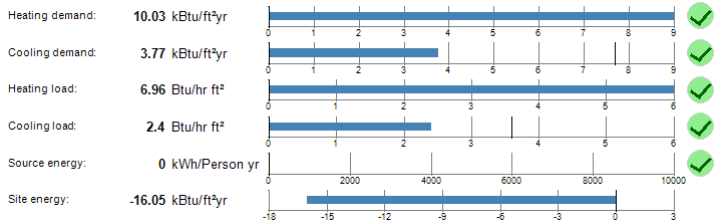


- *Assembly values*
  - *Roof*
  - *Walls*
  - *Slab*
  - *Windows / Doors*
- *Mechanical Systems*
  - *Air Source Heat Pump*
  - *Energy Recovery Ventilator*
  - *Domestic Hot Water*
- *Appliances*

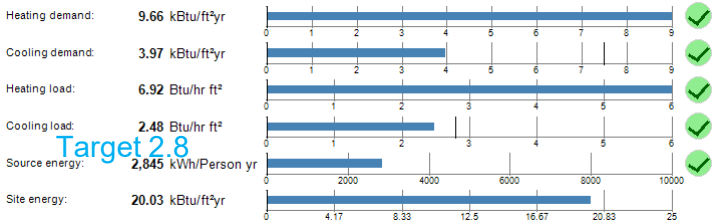
One Design Five Lots



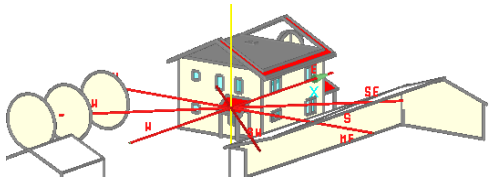
2233 (N entry)



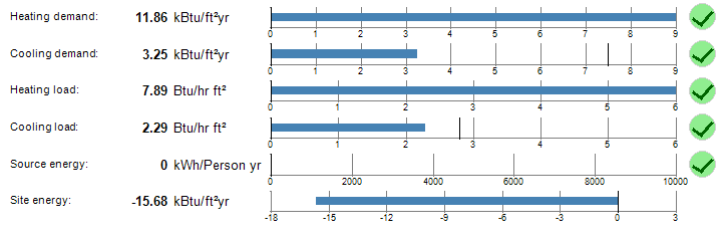
2234 (E entry no solar)

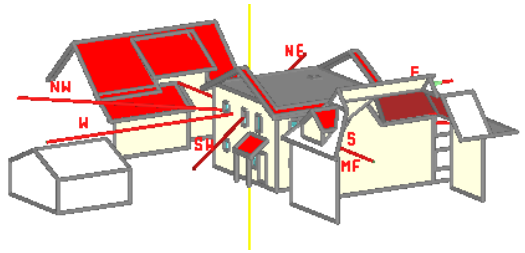


Target 2.8

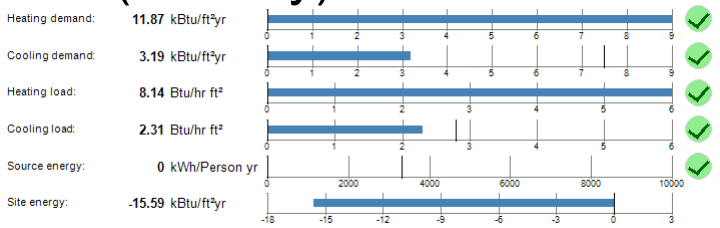


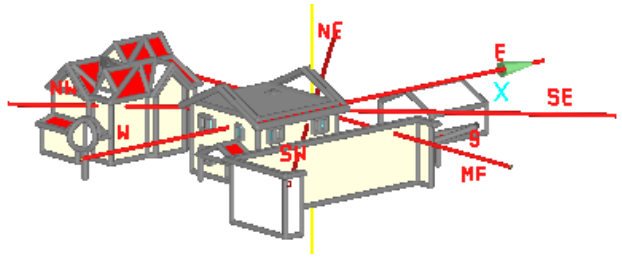
2235 (E entry)



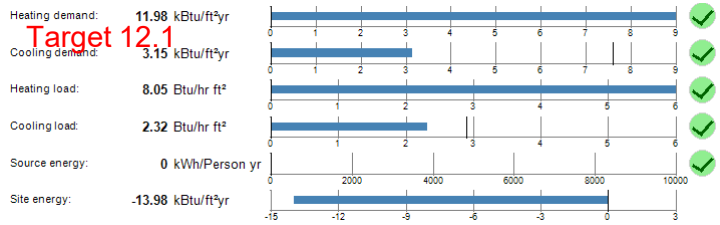


2236 (W entry)

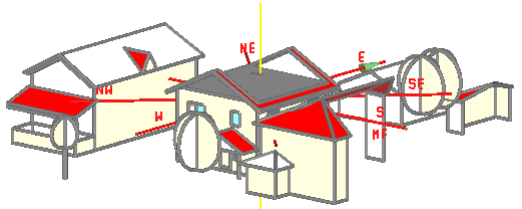




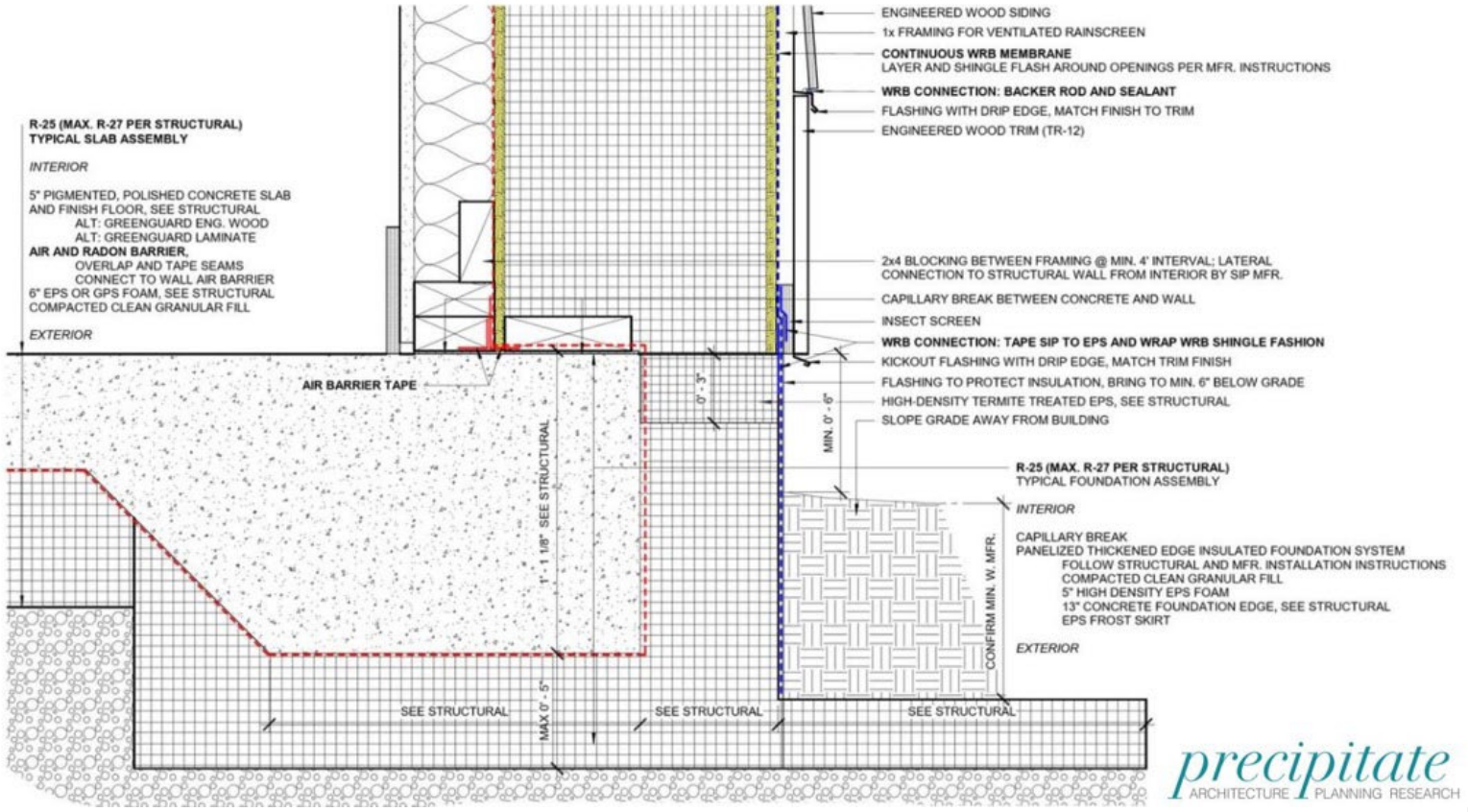
2237 (W entry +3.5”)



Target 12.1



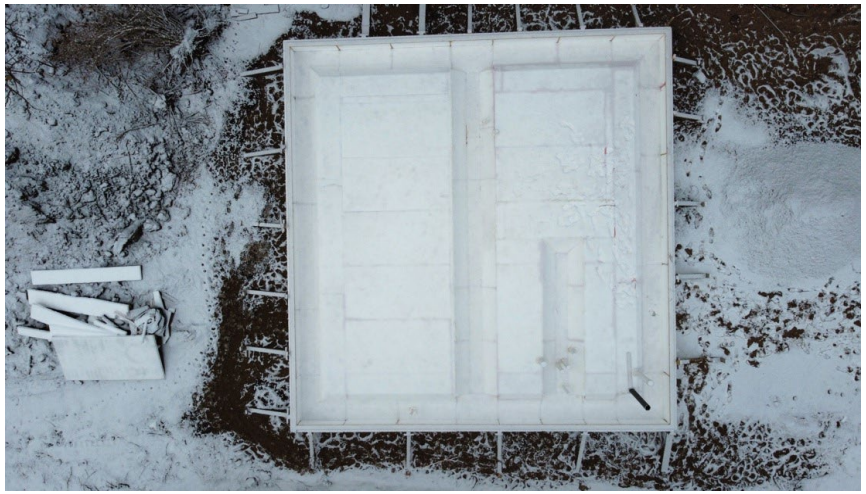
Phase 1: Foundation



Design and Products

- FPSF
  - Build Smart J-Form R25
    - WarmForm
  - Stego Wrap Vapor Barrier
- Plan Review!!!

Phase 1: Foundation



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- Plan Review!!!

Phase 1: Foundation

Design and Products

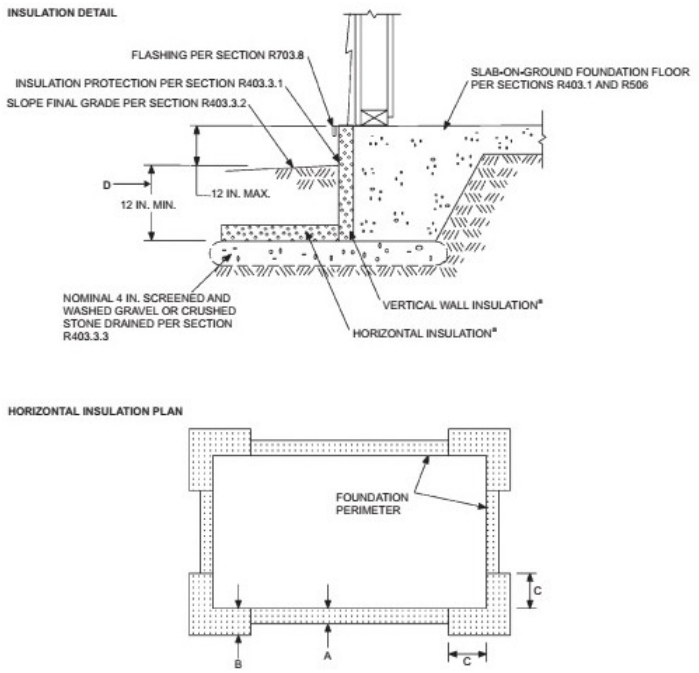
- FPSF
  - Stego Wrap Vapor Barrier
- Plan Review!!!

Phase 1: Foundation

R403.3 Frost-protected shallow foundations.

For buildings where the monthly mean temperature of the building is maintained at not less than 64°F (18°C), footings are not required to extend below the frost line where protected from frost by insulation in accordance with Figure R403.3(1) and Table R403.3(1). Foundations protected from frost in accordance with Figure R403.3(1) and Table R403.3(1) shall not be used for unheated spaces such as porches, utility rooms, garages and carports, and shall not be attached to *basements* or *crawl spaces* that are not maintained at a minimum monthly mean temperature of 64°F (18°C).

Materials used below *grade* for the purpose of insulating footings against frost shall be *labeled* as complying with ASTM C578.



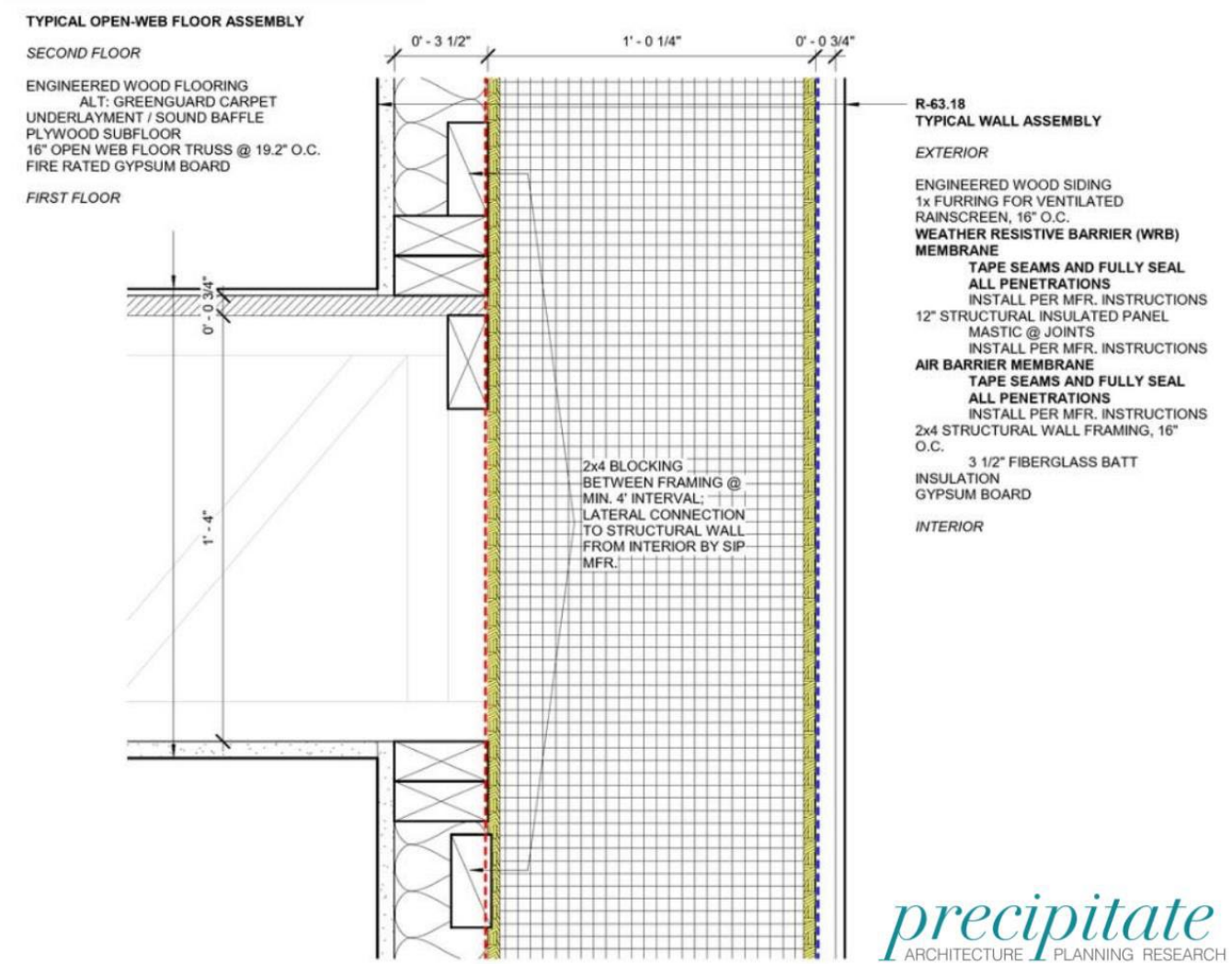
Design and Products

- FPSF
  - Plan Review!!!

R403.1.4.1 Frost protection.
Footings shall not bear on frozen soil. Foundation walls, piers, and other permanent supports of buildings and structures not otherwise protected from frost shall be protected by one or more of the following methods:

1. Extended below the frost line specified in Table R301.2(1).
2. Constructing in accordance with Section R403.3.
3. Constructing in accordance with ASCE 32.
4. Erected on solid rock.
5. Constructing in accordance with Minnesota Rules, Chapter 1303.

Phase 1: Wall



Design and Products

- Walls
  - LP on ¾ rain screen
  - Mento 1000 WRB
  - 12” SIPS R48
  - Intello
  - 2x4 Structural Wall
    - Fiberglass Batt R15
  - Drywall
- Structural!!!

Phase 1: Wall

Design and Products

- Walls
  - LP on ¾ rain screen
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  - 12” SIPS R48
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Phase 1: Wall

Design and Products

- Walls
  - LP on ¾ rain screen
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  - 12” SIPS R48
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    - Fiberglass Batt R15
  - Drywall
- Structural!!!
  - $8522.46

Phase 1: Wall

Design and Products

- Walls
  - LP on ¾ rain screen
  - Mento 1000 WRB
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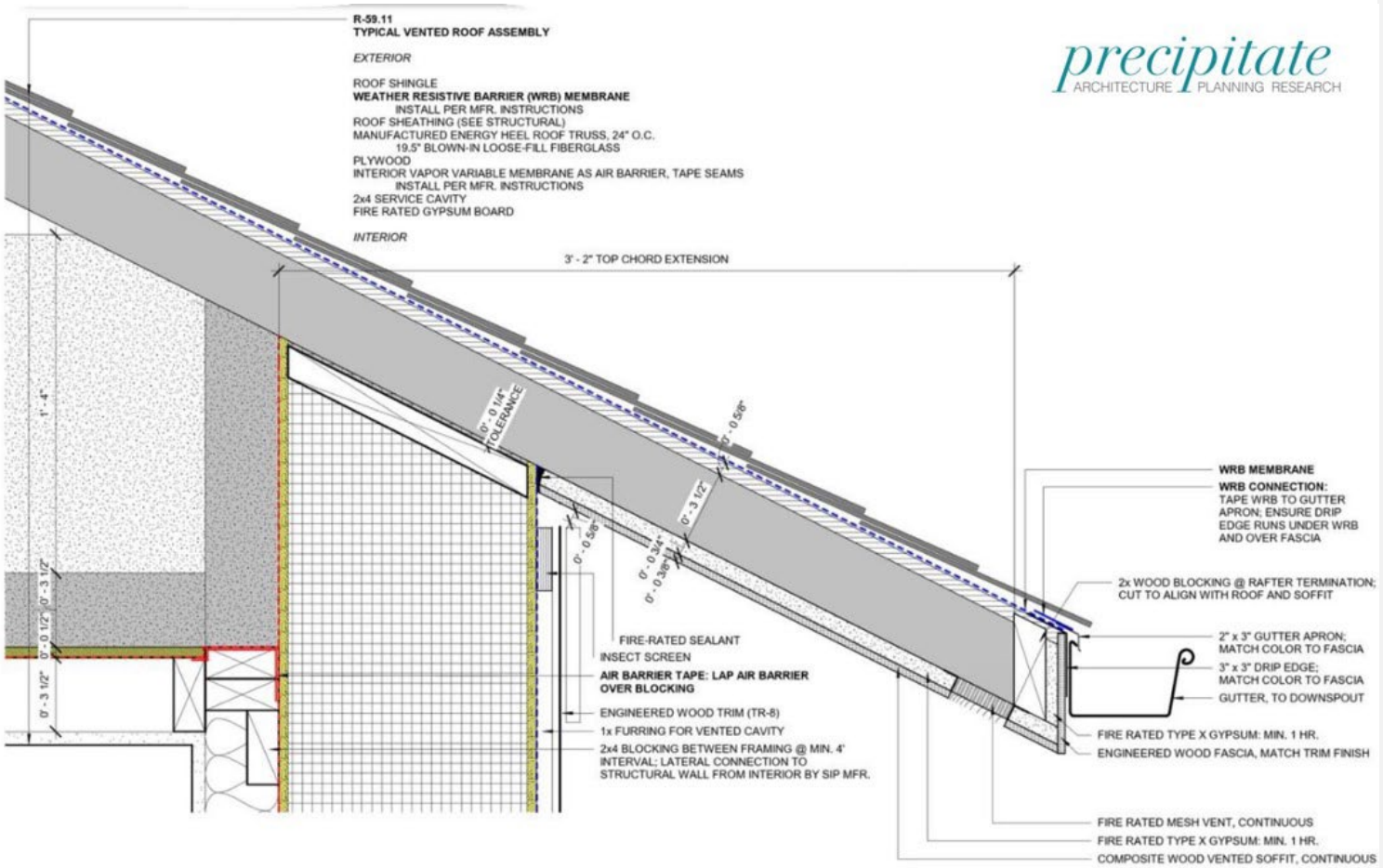
  - 2x4 Structural Wall
    - Fiberglass Batt R15
  - Drywall
- Structural!!!

Phase 1: Ceiling and Roof



precipitate
ARCHITECTURE | PLANNING | RESEARCH

Design and Products

- Ceiling
  - Energy Heel and blown in fiberglass R60
  - Utility Chase
  - Intello Cap
    - EZ Hatch

Phase 1: Ceiling and Roof

Design and Products

- Ceiling
  - Energy Heel and blown in fiberglass R60
  - Utility Chase
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    - EZ Hatch

Phase 1: Ceiling and Roof

Design and Products

- Ceiling
  - Energy Heel and blown in fiberglass R60
  - Utility Chase
  - Intello Cap
    - EZ Hatch

Phase 1: Equipment

A.O. Smith | COMMERCIAL-GRADE
RESIDENTIAL ELECTRIC WATER HEATERS

VOLTEX® HYBRID ELECTRIC HEAT PUMP WATER HEATER

The Voltex Hybrid Electric heat pump water heater from A. O. Smith is the most cost effective energy-efficient option available for consumers who want to save money on their utility bills. Voltex can reduce water heating costs up to 73% and provide payback in 2-3 years. With annual savings of $305 or more, there is no better way to go green than Voltex.

HOW DO THEY WORK?

Absorb ambient heat from the surrounding air to heat water using a compressor and "Environmentally-Friendly" R134a refrigerant

- Self-contained heat pump unit is integrated into the top of the tank
- Multiple operating modes to maximize efficiency and performance

QUALIFIES FOR MANY STATE AND LOCAL UTILITY REBATES - CHECK WWW.DSIREUSA.ORG

INCREASED ENERGY EFFICIENCY

- Improved efficiency designed in, to ensure available hot water at the lowest possible cost. Up to a 3.45 Uniform Energy Factor (UEF) Rating conserves energy and meets ENERGY STAR® qualifications

CHOICE OF OPERATING MODES

- Select from Efficiency, Hybrid, or Electric modes to match heating requirements to environmental conditions.
- Hybrid mode automatically adjusts between compressor and element, depending upon heat requirements.
- Vacation mode reduces operating costs and provides freeze protection during extended absence

BACKUP ELECTRIC ELEMENTS

- Long-lasting backup heating elements help heat water according to environmental conditions, demand, and

DRY FIRE PROTECTION

- Control system checks to ensure the tank is full of water during start up to prevent dry firing the heating elements

ELECTRONIC USER INTERFACE

- User-friendly electronic interface allows easy control of temperature setting, operating mode, and communicates diagnostics
- Easy to read temperature display (see back) shows temperature in °F or °C
- Advanced diagnostics convey error messages for service purposes. The last four error messages are saved in the control system memory.

OTHER FEATURES

- Ideal for basements or garage installations; the compressor transfers heat to the water while dehumidifying and cooling the ambient air

Design and Products

- Equipment Specs
  - DHW: ASHP 3.45 UEF- Voltex Hybrid
  - ERV: RenewAire EV Premium L
  - ASHP Mitsubishi M-Series
    - 10.4 HSPF
    - 18.4 SEER
  - Windows Access Tilt Turns 0.15 U-Value

Phase 1: Equipment

MITSUBISHI ELECTRIC
Heating and Cooling

M-SERIES

SVZ-KP12NA & SUZ-KA12NAHZ

12,000 Btu/h Multi-Position Air Handler Heat Pump

Job Name:	Location:
Purchaser:	Submitte
Submitted to:	Refere
System Designation:	Schedule
Engineer:	

RenewAire
Energy Recovery Ventilation

EV SERIES ERV
Installation, Operation and Maintenance Manual

EV130
EV200
EV240
EV300

Design and Products

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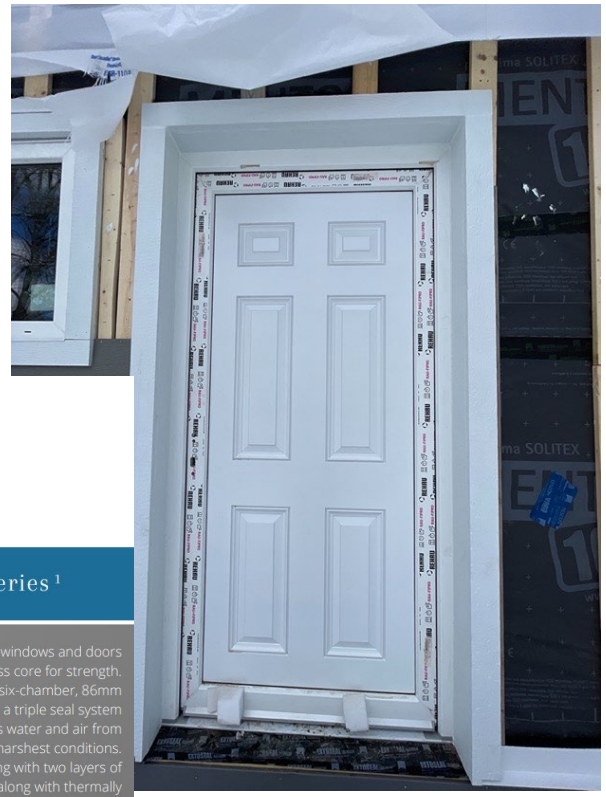

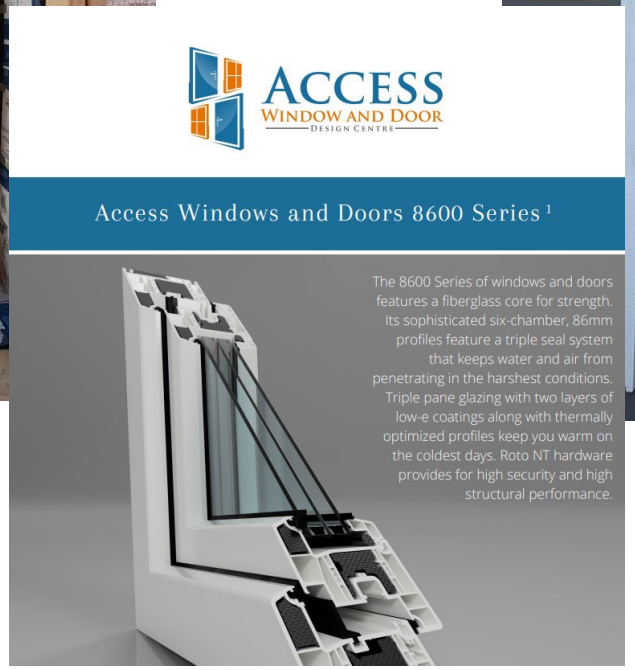

Design and Products

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    - 18.4 SEER
  - Windows Access Tilt Turns 0.15 U-Value

Phase 1: Renewables

APADANA SOLAR TECHNOLOGIES

Preliminary Design

Urban Homeworks
811 31st Ave N
Minneapolis, MN 55411

1/24/2024
Rev 1

Contact:
Andy Goke
651-707-3090
Andy.Goke@ApadanaTechnology.com

System Size: 10.5 kW DC / 26 Panels

Solar and Net Positive

- 10.5 kW System
  - Installed for $3.80/watt
  - Xcel Energy low income up front incentive for $2.75/watt
  - Green cost share production rebate $.40/watt
  - Tax Credits for long term owners 30-40%
  - Xcel Production incentive for $.03/kwh
  - + any net energy sold to xcel.

Phase 1:Results

5 Affordable Home ownership Oppourtunities

- *Available at 80% AMI and 60% AMI with landtrust component*
- *Lower Cost of Ownership*
  - Estimated $333 less per month in terms of utility bills
- *Healthier Home and Community*
  - All electric-no fossil fuels
  - Better Indoor Air Quality
- More Durable Homes
  - Water Control
  - Vapor Control
  - Condensation Management
  - Drying Potential

Phase 1:Results

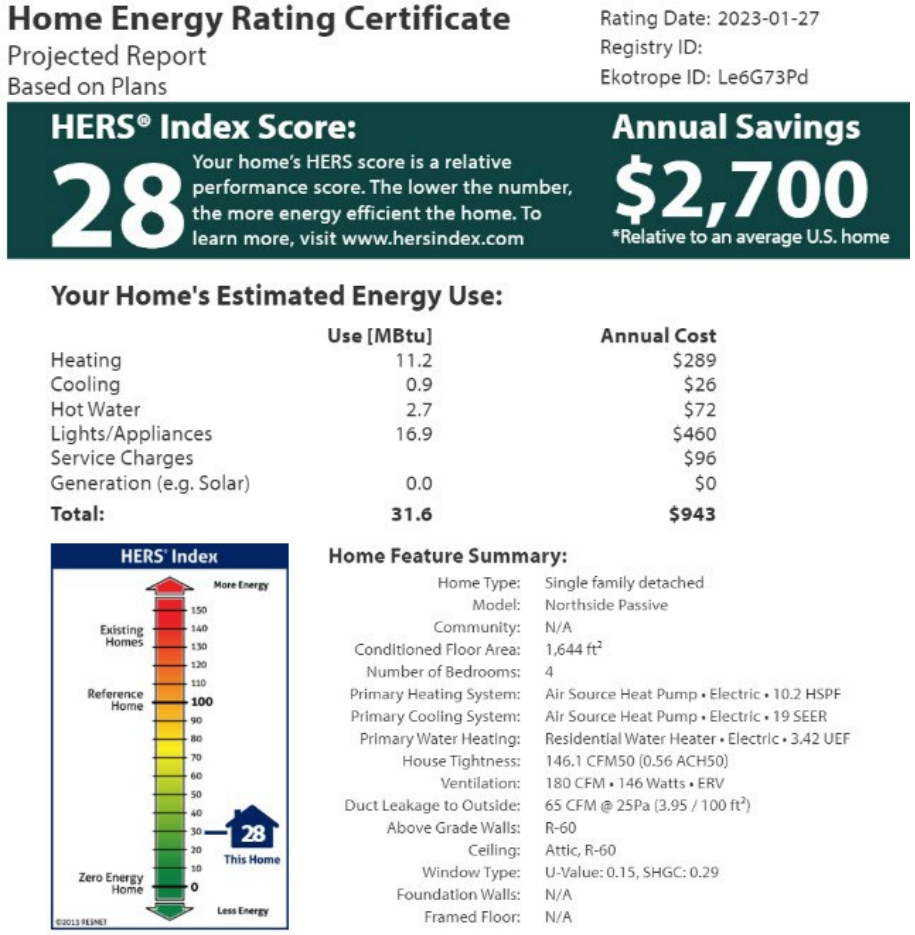
Education of High Performance and Building Science Concepts

- 20+ Site Tours this year and counting
  - Contractors, Architects, Developers, Parade of Homes, University, Churches and others
- Hands on Experience working in a Passive House
  - 2 new GCs (5 staff members)
  - 1 Architecture Firm (4 Architects)
  - 1 Energy Rater Firm (3 Raters)
  - 50 + unique subcontractors

Phase 1: Net Positive

High performance Homes

- HERS Score 28 (Prelim before Solar)
  - Net Positive with Solar -8
- Mid point Blower Door
  - 0.03 CFM50/ft^2
  - .45 ACH
  - 5+ times more airtight than the code requires



Home Energy Rating Certificate
Projected Report
Based on Plans

Rating Date: 2023-01-27
Registry ID:
Ekotrope ID: Le6G73Pd

HERS® Index Score: 28
Your home's HERS score is a relative performance score. The lower the number, the more energy efficient the home. To learn more, visit www.hersindex.com

Annual Savings $2,700
*Relative to an average U.S. home

Your Home's Estimated Energy Use:

	Use [MBtu]	Annual Cost
Heating	11.2	$289
Cooling	0.9	$26
Hot Water	2.7	$72
Lights/Appliances	16.9	$460
Service Charges		$96
Generation (e.g. Solar)	0.0	$0
Total:	**31.6**	**$943**

HERS® Index
More Energy
Existing Homes
Reference Home
Zero Energy Home
28
This Home
Less Energy

Home Feature Summary:

Home Type:	Single family detached
Model:	Northside Passive
Community:	N/A
Conditioned Floor Area:	1,644 ft²
Number of Bedrooms:	4
Primary Heating System:	Air Source Heat Pump • Electric • 10.2 HSPF
Primary Cooling System:	Air Source Heat Pump • Electric • 19 SEER
Primary Water Heating:	Residential Water Heater • Electric • 3.42 UEF
House Tightness:	146.1 CFM50 (0.56 ACH50)
Ventilation:	180 CFM • 146 Watts • ERV
Duct Leakage to Outside:	65 CFM @ 25Pa (3.95 / 100 ft²)
Above Grade Walls:	R-60
Ceiling:	Attic, R-60
Window Type:	U-Value: 0.15, SHGC: 0.29
Foundation Walls:	N/A
Framed Floor:	N/A

Phase 1: Net Positive

High performance Homes

- HERS Score 28 (Prelim before Solar)
  - Net Positive with Solar -8
- Mid point Blower Door
  - 0.03 CFM50/ft^2
  - .45 ACH
  - 5+ times more airtight than the code requires

Home Energy Rating Certificate
Projected Report
Based on Plans

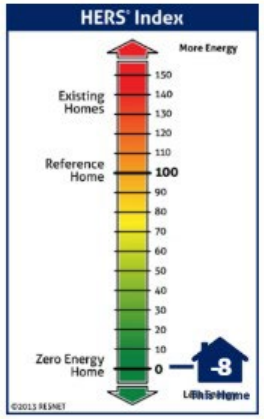
Rating Date: 2023-01-27
Registry ID:
Ekotrope ID: Le6G73Pd

HERS® Index Score: -8
Your home's HERS score is a relative performance score. The lower the number, the more energy efficient the home. To learn more, visit www.hersindex.com

Annual Savings $3,546
*Relative to an average U.S. home

Your Home's Estimated Energy Use:

	Use [MBtu]	Annual Cost
Heating	11.2	$289
Cooling	0.9	$26
Hot Water	2.7	$72
Lights/Appliances	16.9	$460
Service Charges		$96
Generation (e.g. Solar)	41.0	-$847
Total:	**31.6**	**$96**



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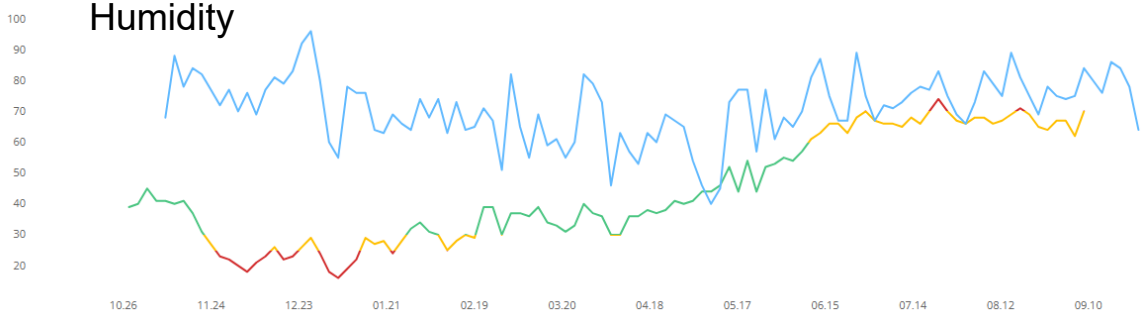
Above Grade Walls:	R-60
Ceiling:	Attic, R-60
Window Type:	U-Value: 0.15, SHGC: 0.29
Foundation Walls:	N/A
Framed Floor:	N/A

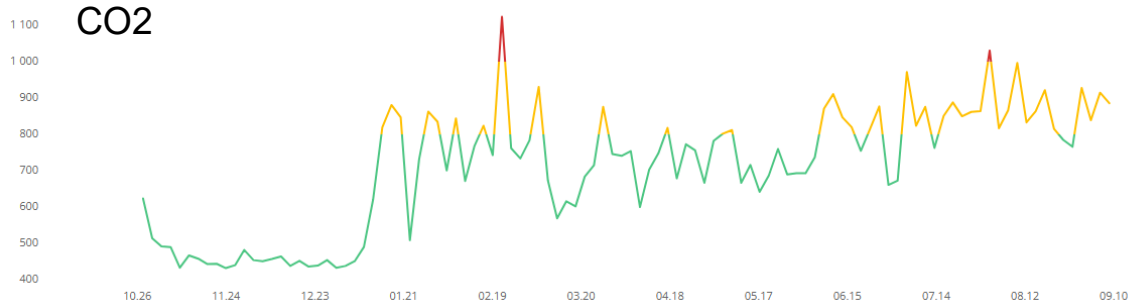
IEQ – site 1

Temperature

Humidity

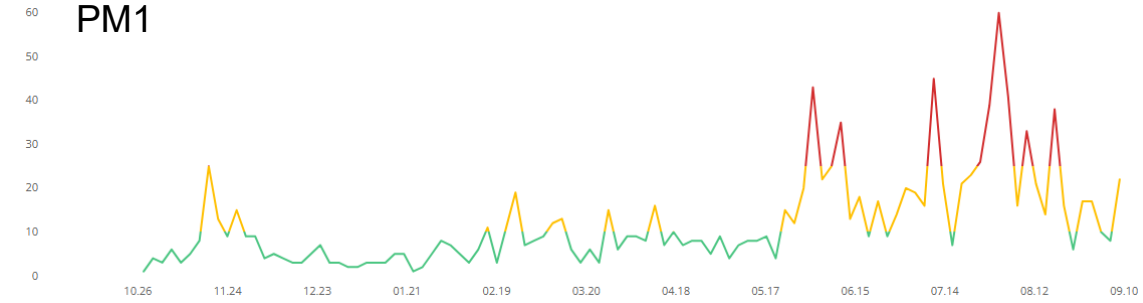


CO2

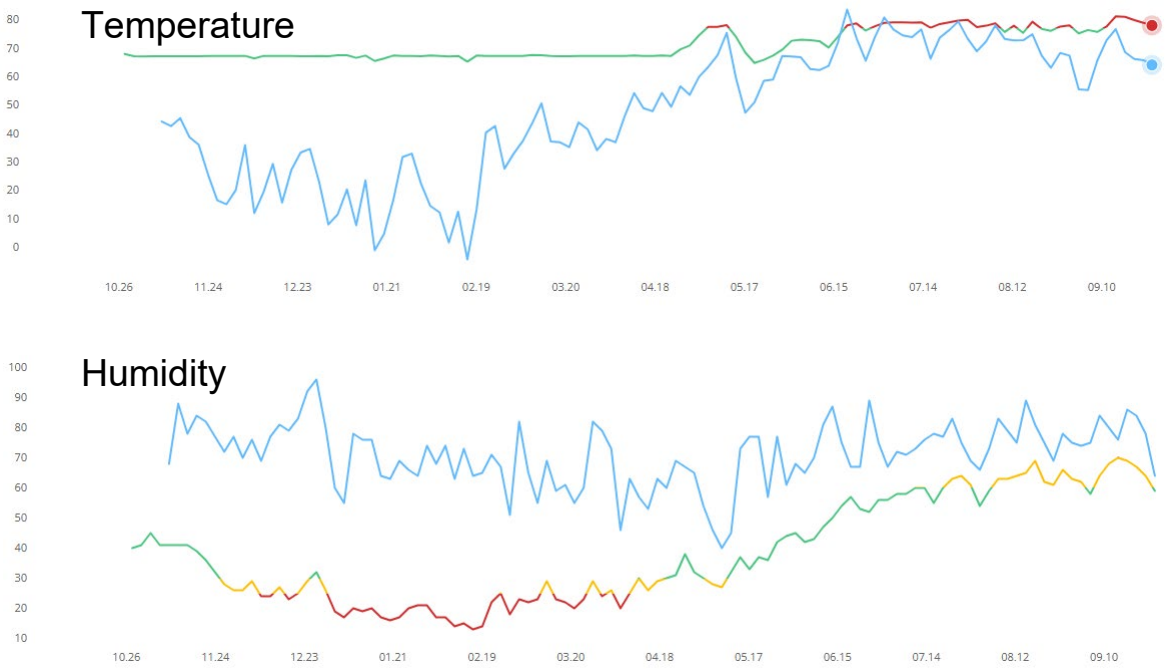


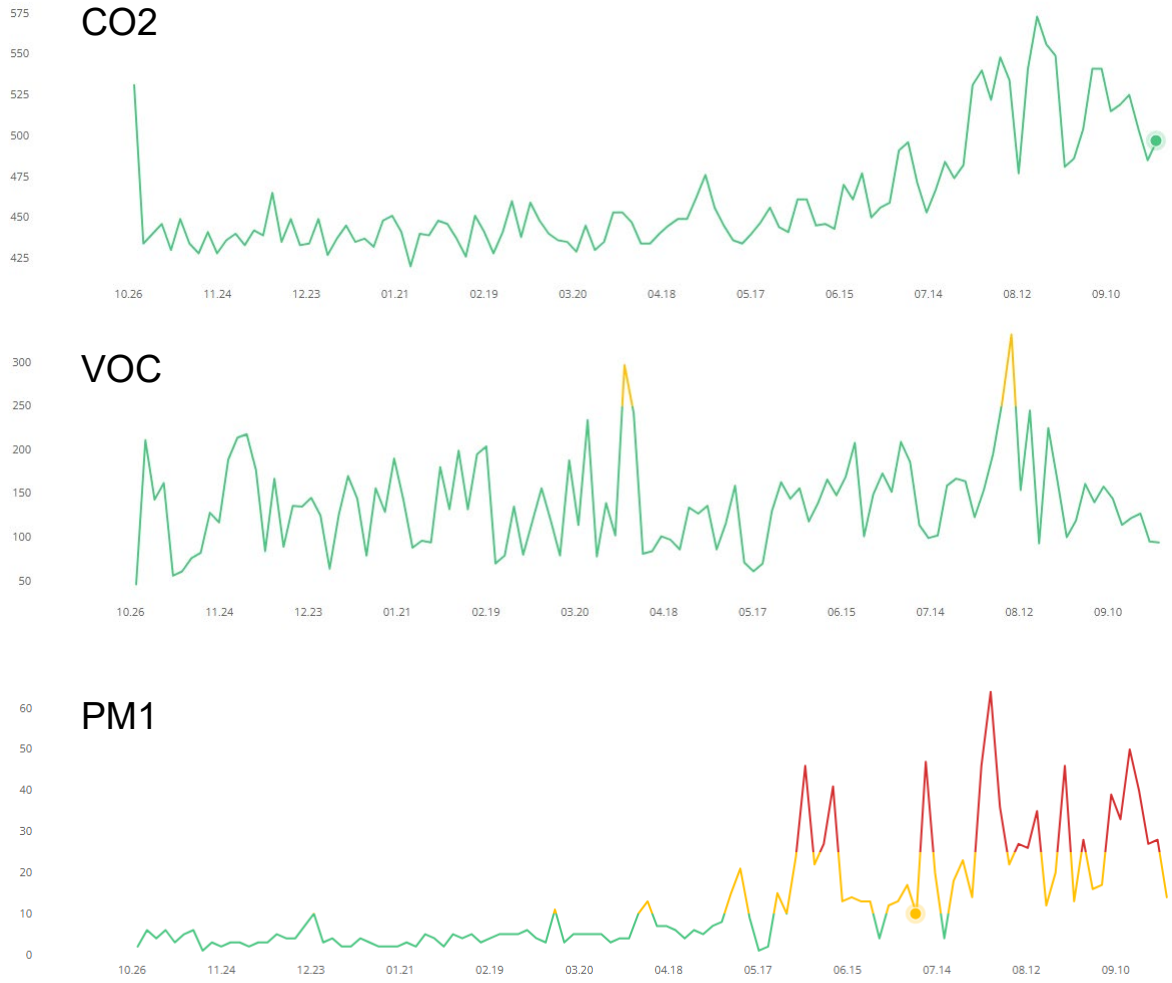
VOC

PM1



IEQ – site 2


Temperature
80
70
60
50
40
30
20
10
0
10.26
11.24
12.23
01.21
02.19
03.20
04.18
05.17
06.15
07.14
08.12
09.10
Humidity
100
90
80
70
60
50
40
30
20
10
10.26
11.24
12.23
01.21
02.19
03.20
04.18
05.17
06.15
07.14
08.12
09.10


CO2
575
550
525
500
475
450
425
10.26
11.24
12.23
01.21
02.19
03.20
04.18
05.17
06.15
07.14
08.12
09.10
VOC
300
250
200
150
100
50
10.26
11.24
12.23
01.21
02.19
03.20
04.18
05.17
06.15
07.14
08.12
09.10
PM1
60
50
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20
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10.26
11.24
12.23
01.21
02.19
03.20
04.18
05.17
06.15
07.14
08.12
09.10

Phase 2: Phius Prescriptive Path

Use Prescriptive Path

- Less costly to model & certify
- More certainty during design & construction
- Can reduce SIP insulation from 12” to 6”

Add Basement

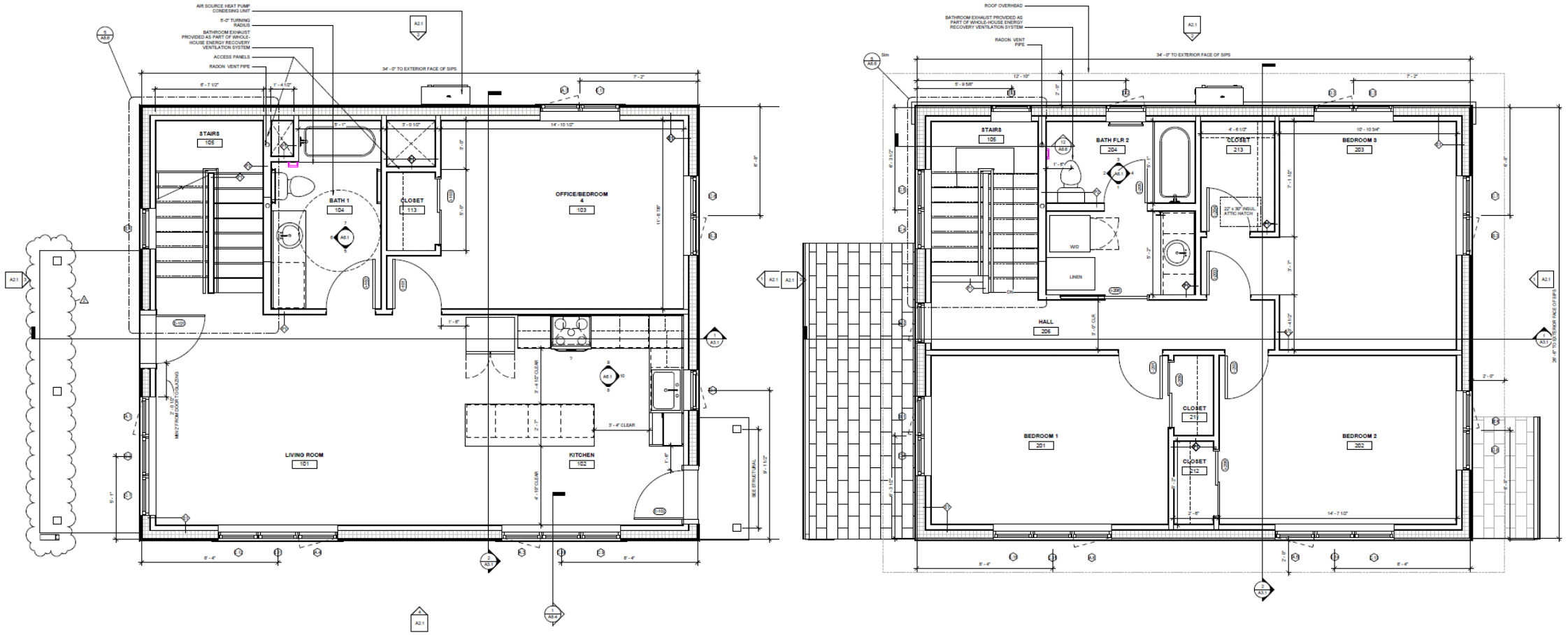
- Additional SF for minimal extra cost
- Simplify construction & permitting
- More space for mechanical systems

Design Tweaks

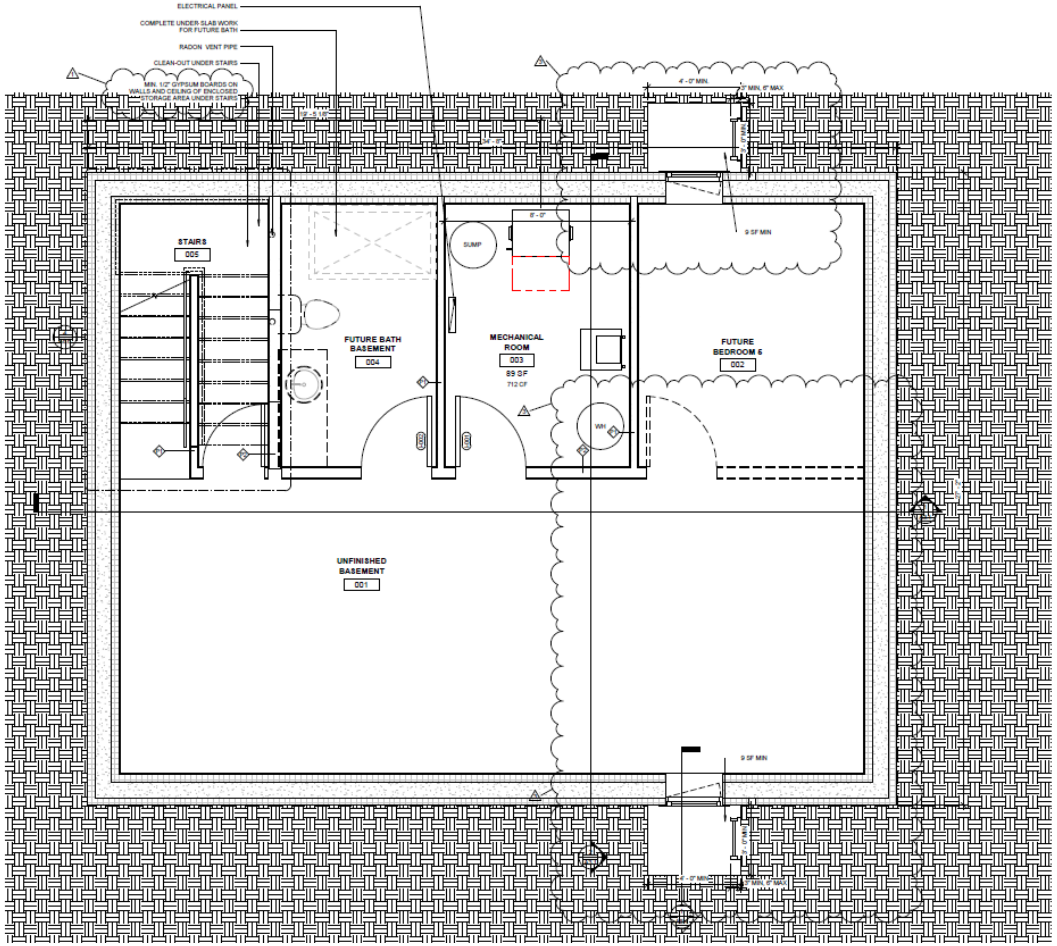
- Increase length EW for solar & more generous floorplan
- Make SIP structural so porches can bear on walls and not be freestanding

precipitate
ARCHITECTURE | PLANNING | RESEARCH

Phase 2: Phius Prescriptive Path



Phase 2: Phius Prescriptive Path



Basement enables:

- *Breathing room on first floor and smarter layout*
- *Space for DWH ASHP functionality (700 CF free space)*
- *Addition SF for minimal additional cost that can be built out over time*

Prescriptive Checklist

Navigate to Endnotes

- Phius CORE 2024 Prescriptive Checklist - V25.1.0 - 03/2025

To view all content in this checklist, make sure to 'enable macros'

Required input	Requirement met.	Calculated.	Threshold
Required dropdown input	Requirement not met.	Calculated from another sheet.	

Instructions: Use the [+] icon on the far left of the screen to expand and view built in compliance calculators.

NR = No Requirement

Input 'X' for verification in columns R & S.

If a particular requirement is not applicable, mark 'X' in column T.

0 Project Information

Project Number:	2834	Project Name:	Northside Passive Prescriptive			Date:	
0.3 Climate Information							
State / Province:	MINNESOTA	Weather Station:	MINNEAPOLIS/CRYSTAL	Climate Zone:	6A	Weather Station Altitude [ft]:	861
0.4 Project Location							
City:	Minneapolis	Street Address:	2015 Queen Avenue North	Zip Code:	55411	Project Altitude [ft]:	875
0.5 Project Team							
Submitter/CPHC Name:	Elizabeth Turner					Phius ID:	112836
Builder Name:	Azad Lassiter					Phius ID:	107139
Rater Name:	Tony Beres					Phius ID:	101009
0.6 Project Specifics							
Project Type:	Single Family Detached - New Construction	Interior Conditioned Floor Area (iCFA) [ft²]:	2,375	Number of Stories:	3	South Façade Azimuth [°]:	180
		Exterior Enclosure Area [ft²]:	5,578	Number of Bedrooms:	4		

Round of Review:	Round 1	
	1/16/2025	4/30/2025	9/19/2025
	User Notes	Phius Review Comments	Submitter Response
		Review comments below by clicking the [+] to the left.	
		Ok.	
		Ok, for Design Certification.	
		Ok, for Design Certification.	
		Review comments below by clicking the [+] to the left.	
		Please provide full street address	Done
		Ok, for Design Certification.	
		Ok	
		Ok	
		Ok	
		Review comments below by clicking the [+] to the left.	
		Ok	
	See takeoffs in plan and elevation on final permit plans completed in Bluebeam Revu. 1. Drawings & Takeoffs\1. Architectural\Takeoffs. Reference 4.1, 4.3, +4.7 for thermal enclosure area, which has now been updated to 5538. In regards to the basement bedroom, the house will be certified before it is sold to an unknown owner. A future owner may or may not install a bedroom in the future, but location should be planned now so egress and ventilation are appropriate. Future bedroom should remain in plans but project will be certified	Takeoffs in "*NorthsidePassive-Permit & Phius Review Set 2025.04.07*" noted. Please provide roof takeoff to confirm 901sf. Walls & slab, Ok	See A1.1 for 'roof takeoff' of 901 SF in blue, this is dimensions to edge of thermal envelope at roof. Dimensioning to edges of roof would include uninsulated areas.

Prescriptive Checklist

2 Airtightness								Design Verified	NA			**Ok, for Design Certification.**	
2.1	**Measured building airtightness q50 ≤ 0.04 cfm/ft2 enclosure area.[4]**											**Ok, for Design Certification.**	
2.1.1	Testing agent identified for preliminary blower door test.[5]							x		Forthcoming OR See LOI noting preliminary blower door test in 6. LOI from Rater or Verifier		Ok, for Design Certification per "*Proposal - PHIUS Rater - Urban Homeworks 4 homes 9-18-2024*"	
2.1.2	Airtightness detail drawings must be comprehensible and show a continuous uninterrupted air barrier that forms from different materials and components at all junctions.							x				Ok, for Design Certification per A3.1 & A8.2 in "*NorthsidePassive-Permit & Phius Review Set 2025.04.07*"	
3 Compactness								Design Verified	NA			**Ok, for Design Certification.**	
3.1	**Building Enclosure Area[6] does not exceed the calculated maximum limit [ft²].**						6,825	YES	x			Ok	
4 Solar Protection								Design Verified	NA			**Review comments below by clicking the [+] to the left.**	
4.1	**Glazed Fenestration Solar Heat Gain Coefficient[7] (SHGC)**											**Ok, for Design Certification.**	
4.1.1	Does not exceed the calculated maximum requirement.[8]							NR	x			Ok, n/a	
4.2	**Glazed Fenestration Area**											**Review comments below by clicking the [+] to the left.**	
4.2.1	The overall window-to-wall (WWR) area ratio[9] is ≤ 18%.						≤ 18%	YES	x			Pending comment below	
4.2.1.1	Orientation (within 90°)	**North**	**East**	**South**	**West**	**Total**	Calculated WWR					-	
	Window Area [ft²]	54	85	127	65	332	13%			See 'Northside Passive Window Calcs' in 3. Calculations for area calculations by orientation.		Notes per A2.1 & A7.1 in "*NorthsidePassive-Permit & Phius Review Set 2025.04.07*" and "*Northside Passive Window Calcs*" N: Ok, 54 E: Ok, 85 S: Ok, 127 W: Noted, 71. Please revise to 65 per documents noted above	Updated to 65
	Gross Above-Grade Wall Area [ft²]	722	536	722	536	2,516				Note: includes basement egress windows and above-grade basement walls. Window areas are removed from this calculation, did revision 41 on update tracker tab below change this so that window areas should not be removed?		Please note that the 2024 requirement for Above-Grade Wall Area has changed and is now gross. Therefore the areas here **should include** the window area. Please revise	Revised to remove window area and larger window wells on South

Prescriptive Checklist: Total UA

5 Thermal Enclosure			Design Verified	NA		Review comments below by clicking the [+] to the left.
5.1	Enclosure meets 5.1.1 OR 5.1.2 below.[18,19]	Choose one: 5.1.2: Total UA (Select / 5.1.1: Individual Component Compliance / 5.1.2: Total UA)				Review comments below by clicking the [+] to the left.
5.1.1	**Individual Component Compliance**			X		Ok, n/a
5.1.1.1	Use the [+] icon on the far left of the screen to expand and input user-defined materials f				ow.	Review comments below by clicking the [+] to the left.
5.1.1a	Fenestration U-Values[20] ≤ maximum **U-value [BTU/h.ft².°F].**	0.13				n/a, 5.1.2 path chosen
5.1.1b	Above-grade walls and cantilevered floors effective **R-Value[21] [ft².°F.h/BTU]** meets calculated minimum.	42				n/a, 5.1.2 path chosen
5.1.1b.1	Use the [+] icon on the far left of the screen to expand and view built in compliance calculators.					n/a, 5.1.2 path chosen
36	**Above-Grade Wall Type 1**					Ok, for Design Certification.
40	**Above-Grade Wall Type 2**					n/a
-	**Cantileverd Floor Type 1**					n/a
-	**Cantileverd Floor Type 2**					n/a
5.1.1c	Roof or ceiling effective **R-Value [ft².°F.h/BTU]** meets calculated minimum.	74				n/a, 5.1.2 path chosen
5.1.1c.1	Use the [+] icon on the far left of the screen to expand and view built in compliance calculators.					n/a, 5.1.2 path chosen
5.1.1d	For whole slab foundations, below-grade walls and floors of conditioned basements and crawl spaces, the effective **R-Value**	23				n/a, 5.1.2 path chosen
5.1.1d.1	Use the [+] icon on the far left of the screen to expand and view built in compliance calculators.					n/a, 5.1.2 path chosen
5.1.1e	For ceilings of unconditioned basements or crawl spaces, and pier and beam floors, the effective **R-Value[22] [ft².°F.h/BTU]** meets	28	x			
5.1.1e.1	Use the [+] icon on the far left of the screen to expand and view built in compliance calculators.					
5.1.1f	Slab edge insulation meets requirements of IECC 2021.[23]		x			
5.1.2	**Total UA Alternative.**[24]		X			Review comments below by clicking the [+] to the left.
5.1.2a	Total building thermal enclosure UA ≤ total UA resulting from the U-factors in Section 5.1.1, Individual Component Compliance.		x			-
5.1.2a.1	*Use the [+] icon on the far left of the screen to expand and view built in compliance calculators.*					-

Whole Building UA Calculation	Total UA, Proposed	Total UA, Reference	Passes?
TOTAL UA **[BTU/h°F]**	202	208	**YES**

Opaque Components				Proposed	Reference		
Name	Component Type	Area [ft²]	R-Value [ft².°F.h/BTU]	U x A [BTU/h°F]	R-Value [BTU/ft².°F.h]	U x A [BTU/h°F]	Ok, for Design Certification.
Roof at insulation layer	**Roof**	901	78	12	74	12	Ok per above
SIP wall	**Wall (Above Grade)**	2,106	37	57	42	50	Ok per above — This includes window area removed
ICF (above grade)	**Wall (Above Grade)**	38	33	1	42	1	Ok per above — This includes window area removed
ICF (below grade)	**Wall (Below Grade)**	1,240	33	38	23	54	Ok per above
Basement Slab	**Slab**	941	24	39	23	41	Ok per above
				-	-	-	-
				-	-	-	-
				-	-	-	-

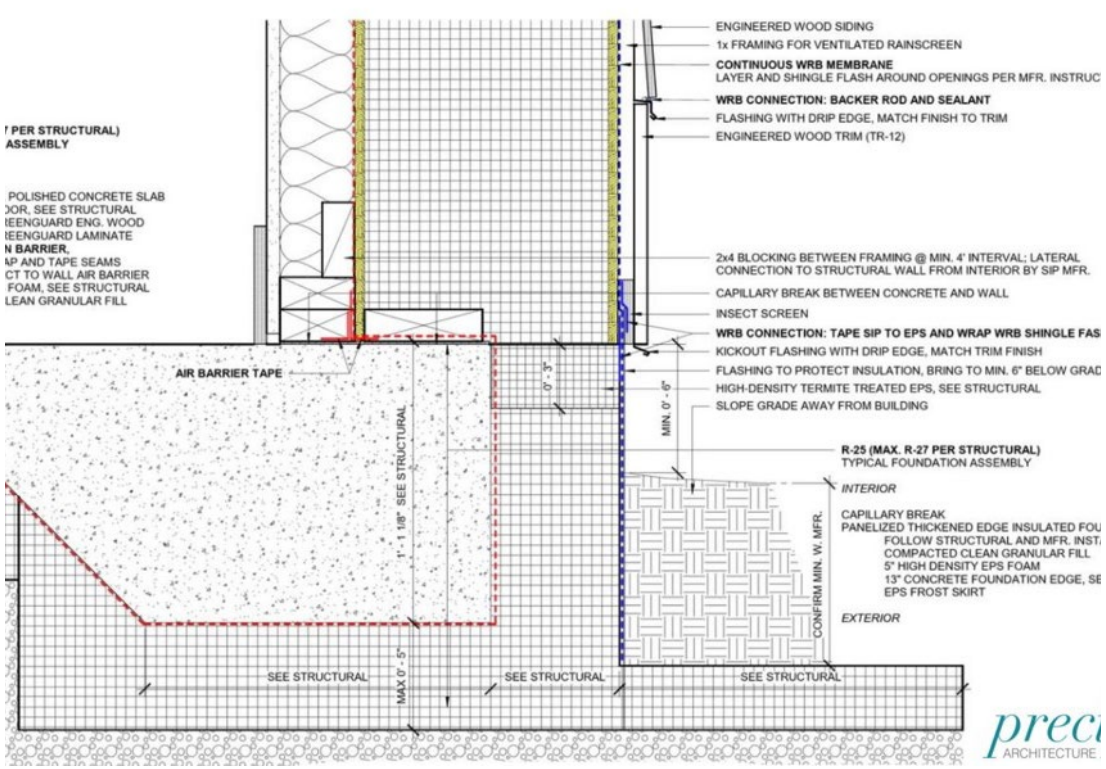
Prescriptive Checklist: Total UA

Fenestration						Proposed	Reference			Review comments below by clicking the [+] to the left.	
Name	Component Type	Height	Area	U-Value	Max. U-Value	U x A	U-Value	U x A		-	
		[ft]	[ft²]	[BTU/ft².°F.h]	[BTU/ft².°F.h]	[BTU/h°F]	[BTU/ft².°F.h]	[BTU/h°F]		-	
Above ground - fixed	Window	4	190	0.15	0.21	29	0.13	25		Noted 0.15 per "*Salamander BluEvolution 82 Fixed W-101705_27-Feb-2024*" Please revise to 0.14 per datasheet	Holding at 0.15 to be conservative so spec can allow for substitution requests.
Above ground - operable	Window	4	122	0.15	0.21	18	0.13	16		Ok 0.15 per "*Salamander BluEvolution 82 Tilt & Turn W-101715_27-Feb-2024*"	
Egress Below grade - operable	Window	4	20	0.15	0.21	3	0.13	3		Ok 0.15 per "*Salamander BluEvolution 82 Tilt & Turn W-101715_27-Feb-2024*"	
Exterior Doors	Door	8	40	0.15	0.16	6	0.13	5		Ok per A2.1 in "*NorthsidePassive-Permit & Phius Review Set 2025.04.07*"	

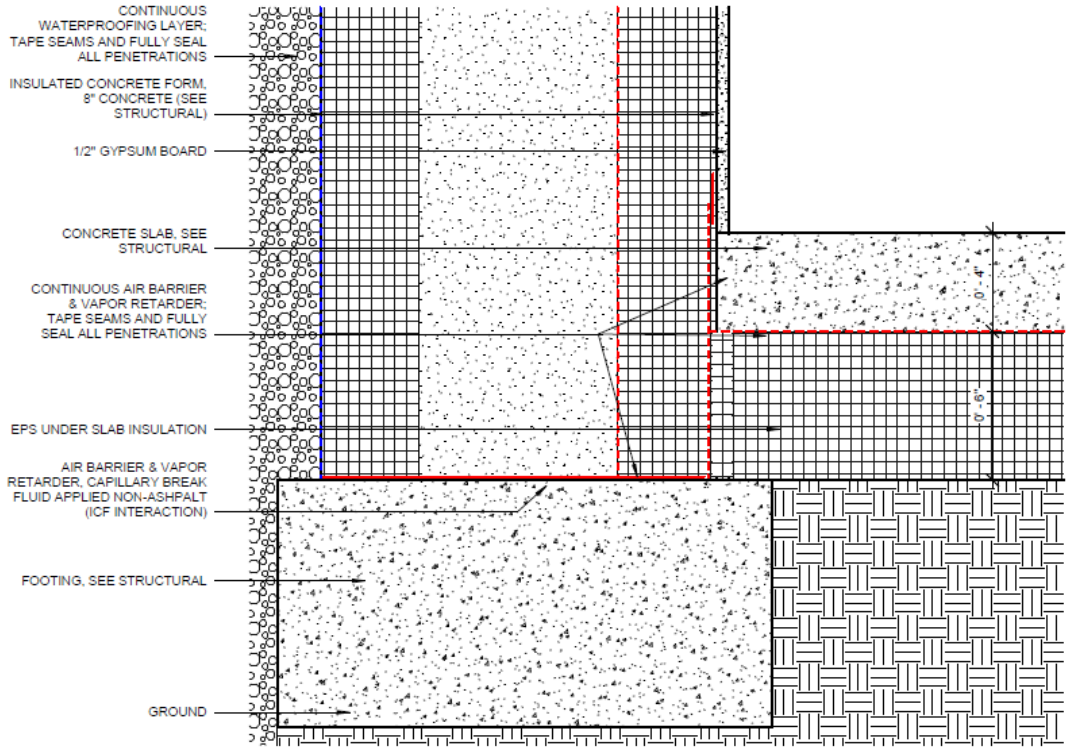
Structure informing design: porch

Detail comparison: Footing

Performance Path

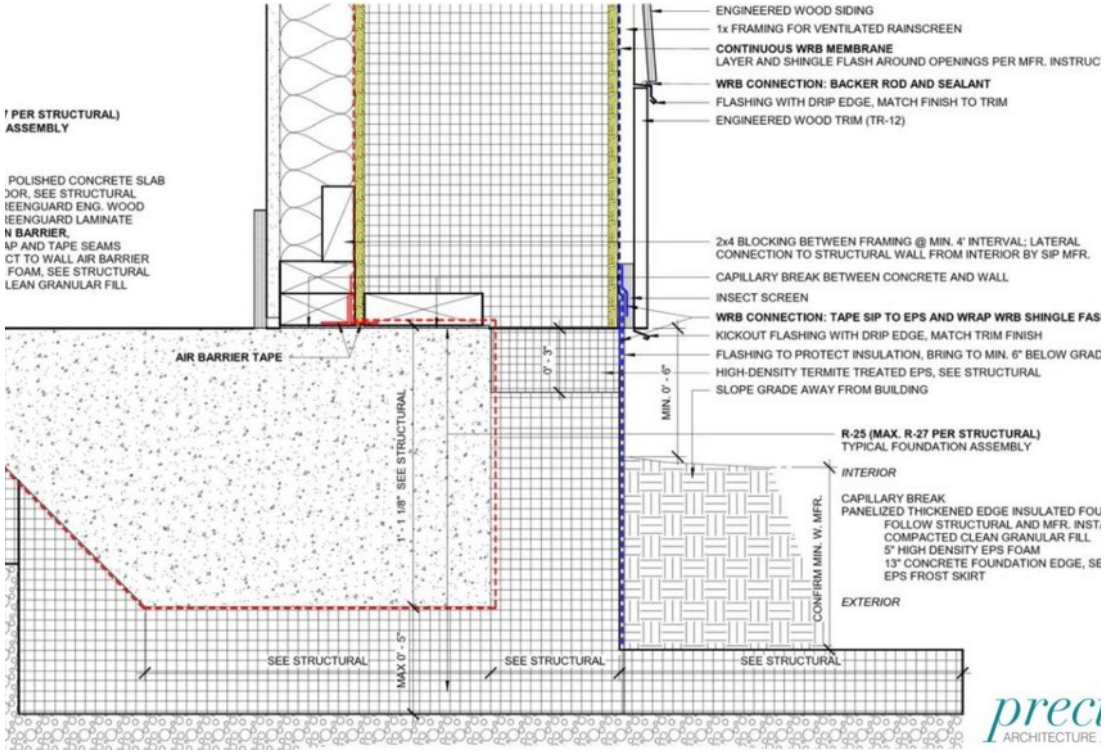


Prescriptive Path

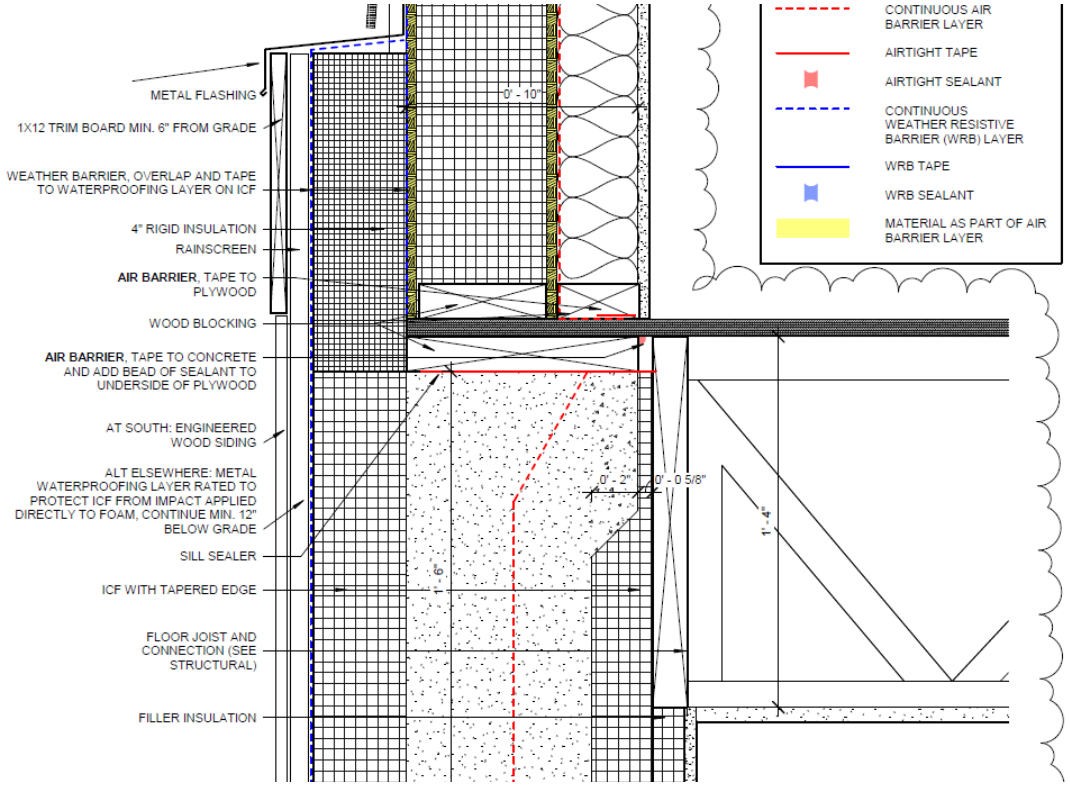


Detail comparison: Wall / Foundation

Performance Path



Prescriptive Path



HERS comparison

Performance Path

Home Energy Rating Certificate
Projected Report
Based on Plans

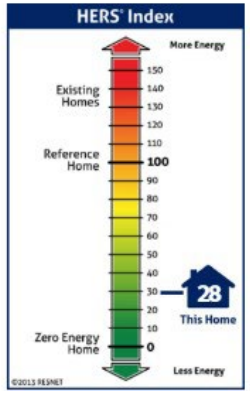
Rating Date: 2023-01-27
Registry ID:
Ekotrope ID: Le6G73Pd

HERS® Index Score: 28
Your home's HERS score is a relative performance score. The lower the number, the more energy efficient the home. To learn more, visit www.hersindex.com

Annual Savings $2,700
*Relative to an average U.S. home

Your Home's Estimated Energy Use:

	Use [MBtu]	Annual Cost
Heating	11.2	$289
Cooling	0.9	$26
Hot Water	2.7	$72
Lights/Appliances	16.9	$460
Service Charges		$96
Generation (e.g. Solar)	0.0	$0
Total:	**31.6**	**$943**



Home Feature Summary:

Home Type:	Single family detached
Model:	Northside Passive
Community:	N/A
Conditioned Floor Area:	1,644 ft²
Number of Bedrooms:	4
Primary Heating System:	Air Source Heat Pump • Electric • 10.2 HSPF
Primary Cooling System:	Air Source Heat Pump • Electric • 19 SEER
Primary Water Heating:	Residential Water Heater • Electric • 3.42 UEF
House Tightness:	146.1 CFM50 (0.56 ACH50)
Ventilation:	180 CFM • 146 Watts • ERV
Duct Leakage to Outside:	65 CFM @ 25Pa (3.95 / 100 ft²)
Above Grade Walls:	R-60
Ceiling:	Attic, R-60
Window Type:	U-Value: 0.15, SHGC: 0.29
Foundation Walls:	N/A
Framed Floor:	N/A

Prescriptive Path

Home Energy Rating Certificate
Projected Report
Based on Plans

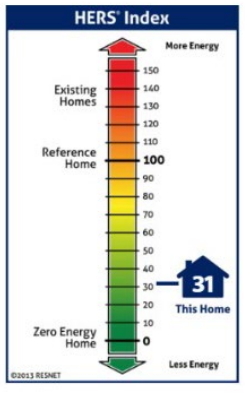
Rating Date:
Registry ID:
Ekotrope ID: dq3ElE82

HERS® Index Score: 31
Your home's HERS score is a relative performance score. The lower the number, the more energy efficient the home. To learn more, visit www.hersindex.com

Annual Savings $4,586
*Relative to an average U.S. home

Your Home's Estimated Energy Use:

	Use [MBtu]	Annual Cost
Heating	12.9	$455
Cooling	1.9	$98
Hot Water	2.7	$107
Lights/Appliances	21.4	$879
Service Charges		$96
Generation (e.g. Solar)	0.0	$0
Total:	**38.9**	**$1,635**



Home Feature Summary:

Home Type:	Single family detached
Model:	Northside Passive Prescriptive
Community:	N/A
Conditioned Floor Area:	2,703 ft²
Number of Bedrooms:	4
Primary Heating System:	Air Source Heat Pump • Electric • 1.75 COP
Primary Cooling System:	Air Source Heat Pump • Electric • 15 SEER
Primary Water Heating:	Residential Water Heater • Electric • 3.45 UEF
House Tightness:	0.04 CFM50 / s.f. Shell Area
Ventilation:	109 CFM • 87.2 Watts • ERV
Duct Leakage to Outside:	108.12 CFM @ 25Pa (4 / 100 ft²)
Above Grade Walls:	R-38
Ceiling:	Attic, R-78
Window Type:	U-Value: 0.15, SHGC: 0.53
Foundation Walls:	R-32
Framed Floor:	N/A

Budget Review

Phase 1 - Completed

- Contractor 1 Average $519,525
  - Home 1-$512,864
  - Home 2-$523,654
  - Home 3-$522,058
- Contractor 2 Average $535,651
  - Home 4-$535,781
  - Home 5-$535,522

Phase 2 - Bid

- Home 6
  - Contractor 2 - $542,966
- Home 7
  - Contractor 2 - $579,407
  - **Contractor 3 - $469,920 awarded**
  - ~~Contractor 4 - $443,228~~
  - Contractor 5 - $583,755

Budget Review -Per Sf Cost

Phase 1 - Completed

- Average Cost $525,976.29
  - Total Project
    - $316 per SF
- Sitework
  - Landscaping, Sidewalks
    - $2.84 per SF
- Garage
  - Foundation, Driveway, Framing, Siding, Roofing, Electrical
    - $54.91 per SF
- Just the House
  - Inlcudes excation, Utilities and all main building components
    - $287.68 per SF

Phase 2 - Bid

- Home 6
  - Total Project
    - 2,712 SF includes basement
      - $200 per SF
    - 1,808 SF Finished Only
      - $300 per SF
      - $267 per SF without Garage and Site
- Home 7
  - Total Project
    - 2712 SF includes basement
      - $173 per SF
    - 1,808 SF Finished Only
      - $260 per SF
      - Don’t have Data without Garage and Sitework

Budget Review

Phase 1

- Foundation Slab on Grade
  - Build Smart System $36,000-40,000
  - Polished Concrete $10,000
- Excavation
  - Shallow Excavation $12,600
  - Soil Corrections 8,000-28,000
- SIPS $33,000
- Windows $16,000

Phase 2

- Foundation Full Basement
  - ICF $60,000
  - Eng. Hardwood Finish Floor $10,000
- Excavation
  - Deep Excavation $29,622
  - Shoring $10,000
  - Soil Correction Unlikely at full basement depth
- SIPS $26,000
- Windows $27,000

Questions

precipitate
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