### **Phius** Prescriptive Path 101



### Prescription for Better Buildings, Faster



### **Ophius** Design: based on a decade of data









## **Ophius** Design: we need our CPHCs



### To scale up the Phius standard

we need the help of all our certified professionals

## **Ophius** Design: Scale up volume, rapidly

#### - Support rapid development of single-family homes

- Climate-specific standard has been successful in SF homes

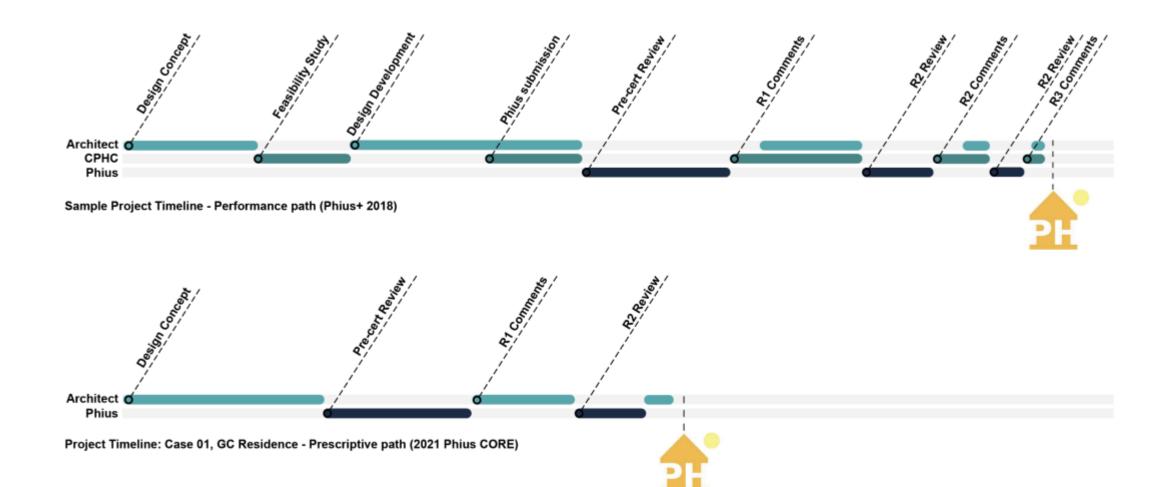
#### - Cost-effective for large-scale community development

- Time, training, resources associated with WUFI Passive and THERM
- Feedback loop increases design timeline

#### - Reduce certification timeline

- Less to check = less rounds of review

### **Ophius** Design: Expedites Certification



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### Criteria Development

(Phius CORE Prescriptive 2021 path from start to plaque)



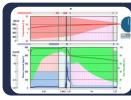




Airtightness



3<sup>rd</sup> Party On-Site Inspection and Quality Assurance



Appropriate Moisture Design



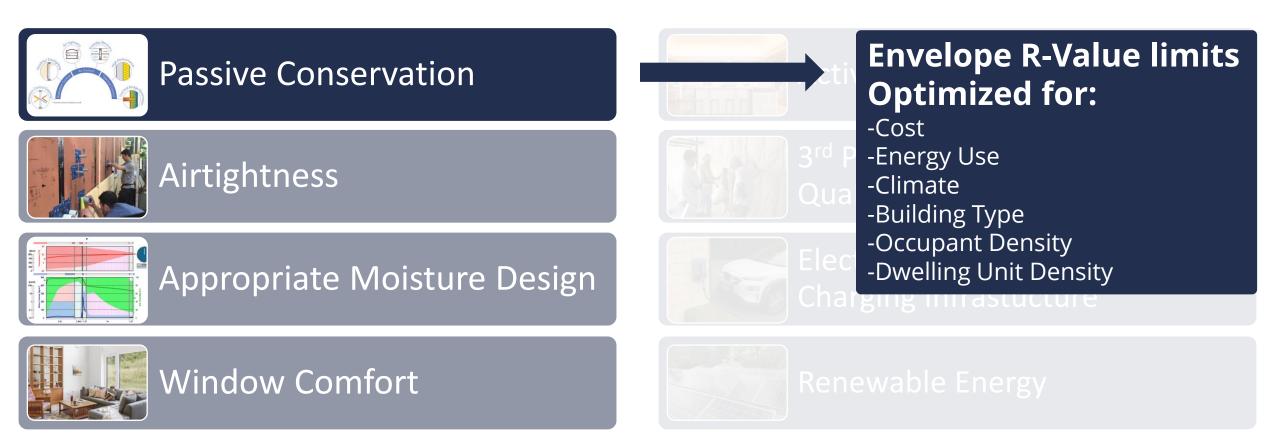
Electrification & Electric Vehicle Charging Infrastructure

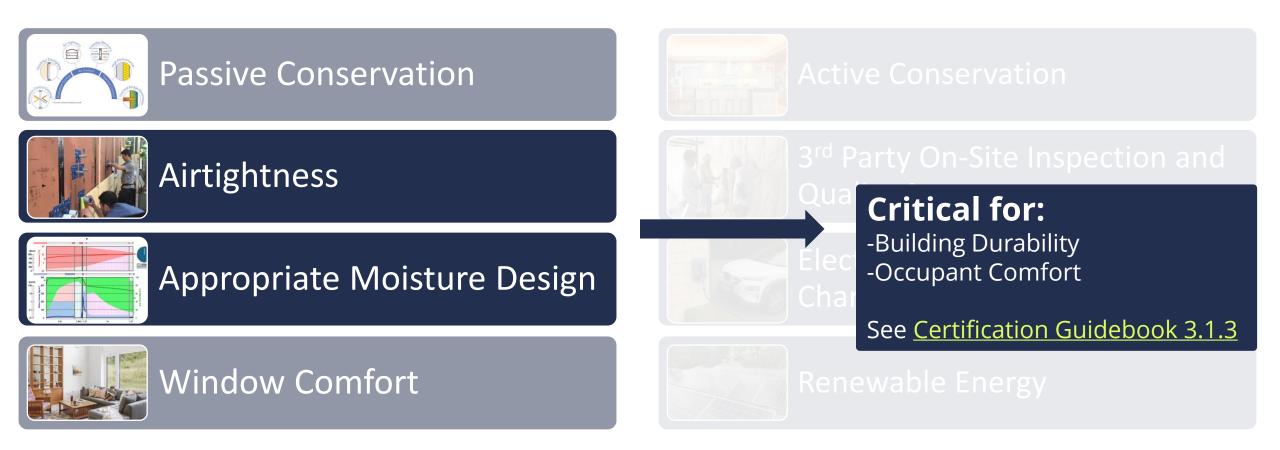


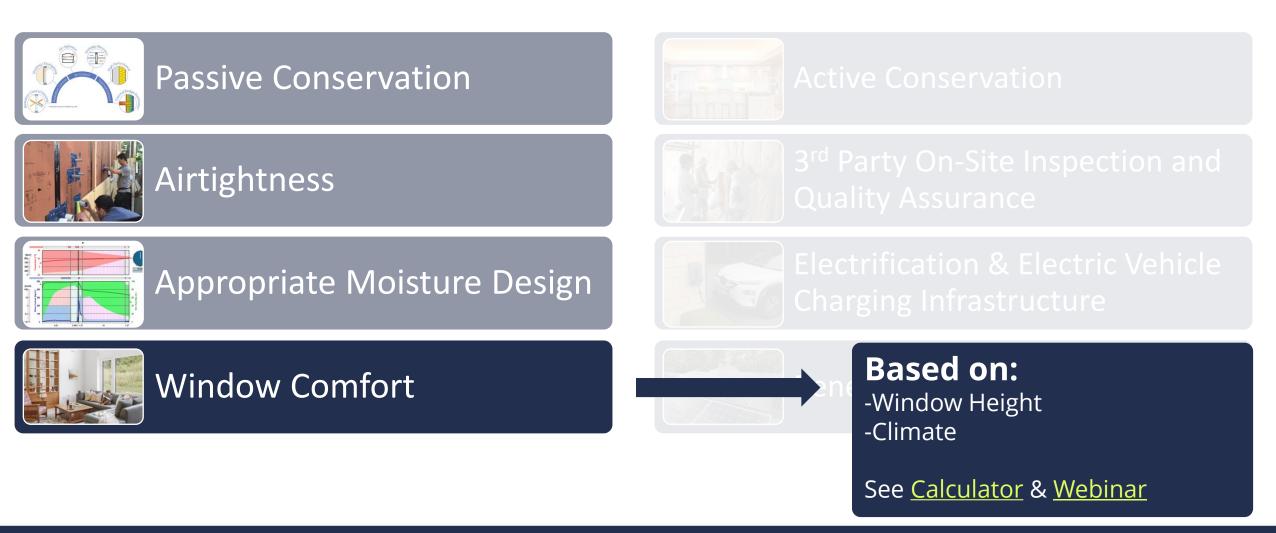
Window Comfort



Renewable Energy







© Phius 2021

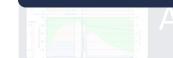
### System Efficiency minimums:

-Appliances -Lighting -Ventilation -Heating/Cooling -Domestic Hot Water





3<sup>rd</sup> Party On-Site Inspection and Quality Assurance



#### Appropriate Moisture Design



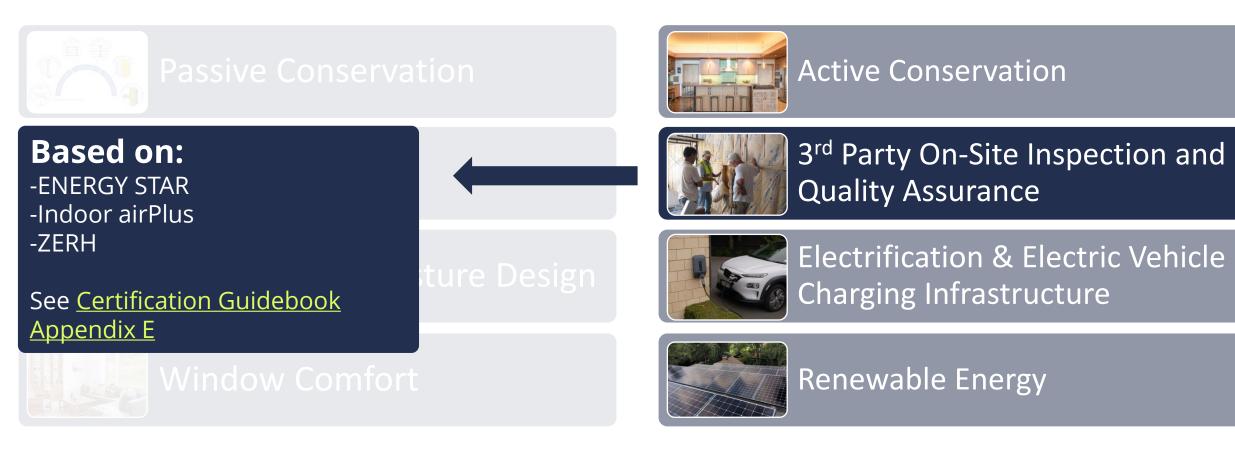
Electrification & Electric Vehicle Charging Infrastructure



Vindow Comfort



Renewable Energy



# **US Depart** HIGH PERFORMA

IECC



	ent of STAIRCA		ЗУ	Electrification Readiness Electric Vehicle Readiness Balanced Ventilation HRV/ERV	Renewable Energy to Get to Zero No Fossil-Fuel Combustion On-Site Electric Vehicle Readiness Balanced Ventilation HRV/ERV		
			SOLAR READY Depends on climate	SOLAR READY ALWAYS	SOLAR READY ALWAYS		
are Energy			Eff. Comps. & H2O Distrib	Eff. Comps. & H <sub>2</sub> O Distrib	Eff. Comps. & H <sub>2</sub> O Distrib		
Recer 85			EPA Indoor airPLUS VI	EPA Indoor airPLUS VI	EPA Indoor airPLUS VI		
			Ducts in Condit. Space	Ducts in Condit. Space	Ducts in Condit. Space		
ss finny,	HVAC QI w/WHV	HVAC QI w/WHV	HVAC QI w/WHV	Micro-load HVAC QI	Micro-load HVAC QI		
	Water Management	Water Management	Water Management	Water Management	Water Management		
	Independent HERS Verification	Independent HERS Verification	Independent HERS Verification	Independent HERS Verification	Independent HERS Verification		
IECC 2012 Enclosure	IECC 2012 Enclosure	IECC 2012 Enclosure	IECC 2015/18 Encl./ES Win.	Ultra-Efficient Enclosure	Ultra-Efficient Enclosure		
HERS 70-80	HERS 60-70	HERS 50-60	HERS 35-45	HERS 30-40	HERS < 0		
IECC 2012	ENERGY STAR v3	ENERGY STAR v3.1	ZERO ZERH	@ phius	@ phius		
	© Phius 20						

### Passive Conservation

Airtightness



3<sup>rd</sup> Party On-Site Inspection and Quality Assurance

Electrification & Electric Vehicle

**Exceptions:** -Back-up or emergency power -No parking is planned





indow Comfort



**Charging Infrastructure** 

**Renewable Energy** 



Airtightness





3<sup>rd</sup> Party On-Site Inspection and Quality Assurance

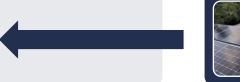


Appropriate Moisture Design



Electrification & Electric Vehicle Charging Infrastructure

Not Credited for Certification -Credited in the performance path





Renewable Energy

### **Ophius** Criteria: Design Limitations

#### **Types allowed:**

- Single-family detached
- Side-by-side duplexes
- Side-by-side townhomes



## **Ophius** Criteria: Design Limitations

#### **Building 'compactness' aka maximum envelope area**

- Form factor (envelope area ÷ interior conditioned floor area [iCFA])
- Guidebook Section 4.4.1.4 definition for iCFA

#### iCFA/bedroom < 900 ft2

- Controls building occupant density

No fossil fuel combustion equipment No jetted tubs / indoor pools No natural draft fireplaces

### **Ophius** Criteria: Airtightness is critical

#### **Improved airtightness**

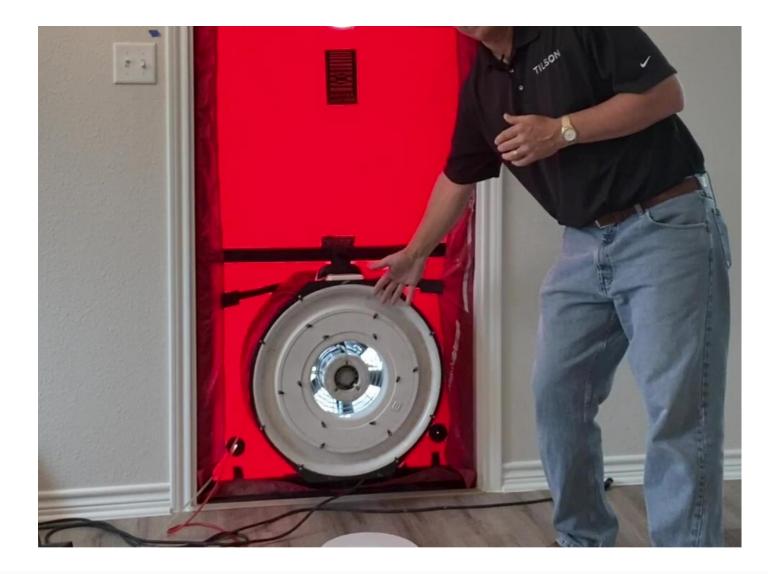
- 0.04 cfm50/sf

# Preliminary blower door required

- Catch durability issues early

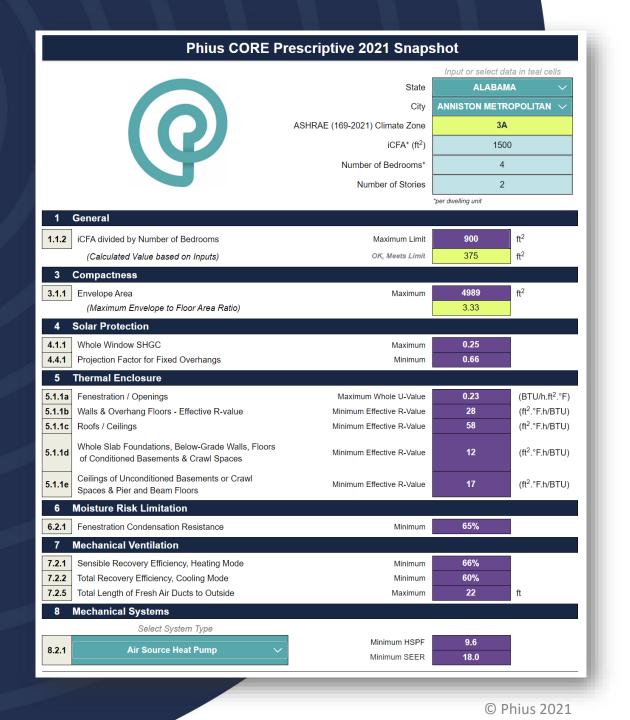
#### Mitigates risks

- Conservative approach due to lack of energy modeling

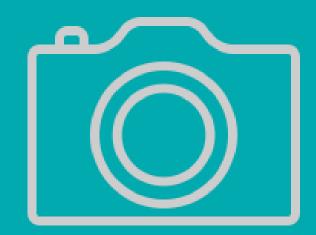


### Getting started

(Phius CORE Prescriptive 2021 path from start to plaque)



Phius CORE Prescriptive Snapshot (www.phius.org)



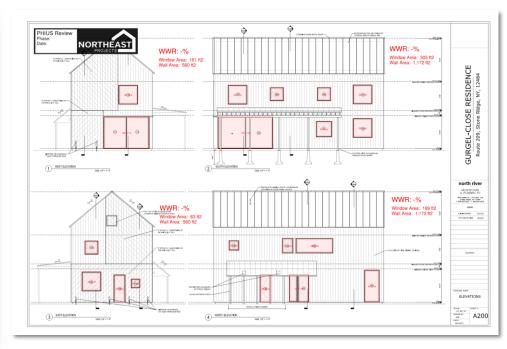


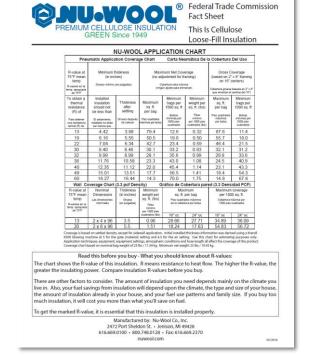
### **Ophius** Prescriptive Checklist

- Phius CORE Prescriptive 2021 Checklist - V2.9 - 03/2023								
*To view all content in this checklist, make sure to 'enable ma		R = No Requirement r verification in columns R	5					
Required dropdown menu inputs. Requirement not met. Calculated from a		rticular requirement is not						
installations: Osciale [1] foor on the fair error of che second of copand and view bailing	Above-Grade Wall Type 1							
0 Project Information	Share & Changes Mall Assess	h h a Talana	Mall True B (4)	Francisco de construit de constru				
Phius Project Number: Project Name:	Step 1: Choose Wall Assem	oly Type.	Wall Type B (1)	Framed assemblies with sor	ne insulation value outsi	e of the framing	g or structure.	
0.3 Climate Information State / Province: ILLINOIS City: CAGO OHAR	Step 2: Fill in assembly mat	erials, thicknesses	& framing.					
0.4 Project Location								
City: Street Address:	Material La	iyer	Material Type	Thickness [in]	Framing T	ype	R/in	Effective R-
0.5 Project Team Submitter/CPHC Name:	//	-			-			Value
Builder Name:	Continous Exterior	Insulation	Polyisocyanurate	3			5.8	17.4
Rater Name:	Sheathin	g	Plywood	3/4			1.4	1.1
0.6 Project Specifics	Insulated Ca	ivity	Cellulose (Blown-in Wall)	5 1/2	Wall Wood Fram	e (24" o.c.)	3.8	16.6
Project Type: Single Family Detached - New Construction Exterior Enclosure Area [ft <sup>2</sup> ]:	Interior Fin	ish	Gypsum Wall Board	5/8	-		0.9	0.6
1 General	-				-		0.0	0.0
	-				-		0.0	0.0
2 Air-Tightness							0.0	0.0
3 Compactness							0.0	000000000000000000000000000000000000000
4 Solar Protection	Step 3: Review hygrotherm	al & moisture guid	elines.		≥0.35	Requ	ired Ratio	Calculated Ratio
5 Thermal Enclosure	5 Thermal Enclosure							
18.         5.1 Enclosure meet 5.1.1 OR 5.1.2 below. <sup>18,19</sup> Choose one:			······································		YES		0.35	0.77
5.1.1 Individual Component Compliance     5.1.2 Use the [+] icon on the far left of the screen to expand and input user-defined materials for the comp	Charles & Devices Effective D.V	(-)			≥38	Requir	ed R-value	Calculated R- value
20         5.1.1a         Fenestration U-Values <sup>30</sup> ≤ maximum U-value [BTU/h.ft².ºF].           21         5.1.1b         Above-grade walls and cantilevered floors effective R-Value <sup>31</sup> [ft².ºF.h/BTU] meets calculated minimum	Step 4: Review Effective R-	value to confirm c	ompliance with required R-value.					
5.1.1b.1 Use the [+] icon on the far left of the screen to expand and view built in compliance calculators					NO		38	36
36         Above-Grade Wall Type 1           40         Above-Grade Wall Type 2								
Above-Grade Wall Type 2     Cantileverd Floor Type 1								
Cantileverd Floor Type 2								
5.1.1c Roof or ceiling effective R-Value [ft <sup>2</sup> .%F.h/BTU] meets calculated minimum.	69							
5.1.1c.1 Use the [-] icon on the far left of the screen to expand and view built in compliance calculators.     For whole siab foundations, below-grade walls and floors of conditioned basements and crawl spaces, the effect of the screen term of	ffective <b>R-Value</b>							
5.1.1d [ft <sup>2,</sup> °F.h/BTU] meets the calculated minimum.	20							
5.1.1d.1 Use the [+] icon on the far left of the screen to expand and view built in compliance calculators.	-							
22 5.1.1e For ceilings of unconditioned basements or crawl spaces, and pier and beam floors, the effective R-Value <sup>22</sup> [f meets calculated minimum.	ft <sup>2</sup> .°F.h/BTU] 25							
5.1.1e.1 Use the [+] icon on the far left of the screen to expand and view built in compliance calculators.								
23 5.1.1f Slab edge insulation meets requirements of IECC 2021. <sup>23</sup>								
24 5.1.2 Total UA Alternative. <sup>24</sup>								
25 5.2 Reduced Thermal Bridging <sup>25</sup>	<b>D</b> size	Batas						
6 Moisture Risk Limitation	Design Verified	Rater NA Verified	-					
33     7 Mechanical Ventilation <sup>33</sup>	Design Verified Design	Rater NA Verified NA	-					
8 Mechanical Systems 9 Lighting, Appliances & Water Heating	Verified Design	Hater NA Verified Rater NA						
<ul> <li>9 Lighting, Appliances &amp; Water Heating</li> <li>10 Electric Vehicle Ready<sup>50</sup></li> </ul>	Verified Design	Verified NA Bater NA						
	Verified	Verified NA						
E Endnotes								

### **Ophius** Design Certification Documents







1. Prescriptive Checklist

#### 2. Construction Drawings and Takeoffs

#### **3. Datasheets**

**Final Certification** 

		equired input cells.	Requirement met.	se sure co er	Calculated.	_		<ul> <li>No Requirem</li> </ul>	
11		equired input cells. d dropdown menu in		Calaviat	d from another sheet.	Threshold	d Input X for verification in column		
L			icon on the far left of the screen to exp				If a particular requirement is not applicable, mark X in column T.		
Ť.									
	0 Project Information								
Ε	Phius Project Number:	Project N	lame:					Date:	
L	0.3 Climate Information								
L		ince: ILLINOIS	Cit	CHICAGO OH	ARE INTL AP			Climate Zone:	5A
L	0.4 Project Location			-					
-	City: 0.5 Project Team			Street Address:				Zip Code:	
H	Submitter/CPHC N	ame.						Phius ID:	
H	Builder N							Phius ID:	
F	Rater N							Phius ID:	
	0.6 Project Specifics		Interior conditioned Floor Area lices						
	Project Type: Single Family Detached - Ne	w Construction	Interior conditioned Ploor Ales (ICP)		Number of Stories:		South Facad	e Azimuth [º]:	180
L	· · · · · · · · · · · · · · · · · · ·		Exterior Enclosure Area [ft <sup>2</sup>	l:	Number of Bedrooms:				
	1 General						Design Verified	Bater Verified	NA
	2 Air-Tightness						Design Verified	Bater Verified	NA
	3 Compactness						Design	Bater	NA
	3 compactness						Verified	Verified	
	4 Solar Protection						Design Verified	Bater Verified	NA
							Design	Bater	
	5 Thermal Enclosure						Verified	Verified	NA
	5.1 Enclosure meets 5.1.1 OR 5.1.2	below. <sup>18,19</sup>	Choose one	:	Select				
	5.1.1 Individual Component Com	pliance							
			to expand and input user-defined mat	erials for the cor	npliance calculators in sectio		ind 3 below.		
	5.1.1a Fenestration U-Values					0.15			
L			effective R-Value <sup>21</sup> [ft <sup>2</sup> .*F.h/BTU] meets			38			
-	5.1.1b.1 Use the [+] icon 36 Above-Grade Wall Type 1	on the far left of the	screen to expand and view built in con	pliance calculat	ors.				
	40 Above-Grade Wall Type 2								
	Cantileverd Floor Type 1								
	Cantileverd Floor Type 2								
Γ			[U] meets calculated minimum.						
			screen to expand and view built in con				_		
-	5.1.1d [ft <sup>2</sup> .°F.h/BTU] meets t		alls and floors of conditioned basemer	ts and crawl spa	ces, the effective R-Value				
-			screen to expand and view built in con	nliance calculat				I	
	For cellings of uncond	itioned basements or	crawl spaces, and pler and beam floor:	the effective P	Value <sup>22</sup> Ift <sup>2</sup> .ºF.h/BTU <sup>1</sup>				
	meets calculated mini	mum.							
			screen to expand and view built in con	pliance calculat	ors.				
	5.1.1f Slab edge insulation n	neatr requirements of	IECC 2021.20						
		need requirements of							
	5.1.2 Total UA Alternative. <sup>24</sup>	inces requirements of							
		icco requiremento o							
	5.1.2 Total UA Alternative. <sup>24</sup>						Design Verified	Bater	
	5.1.2 Total UA Alternative. <sup>24</sup> 5.2 Reduced Thermal Bridging <sup>23</sup> 6 Moisture Risk Limitation					_	Design Verified Design	Verified	
	5.1.2 Total UA Alternative. <sup>24</sup> 5.2 Reduced Thermal Bridging <sup>23</sup>	ices requirements of					Verified		NA NA
	5.12 Total UA Alternative <sup>34</sup> 5.2 Reduced Thermal Bridging <sup>23</sup> 6 Moisture Risk Limitation 7 Mechanical Ventilation <sup>33</sup>	ices requirements of					Verified Design Verified Design	Verified Bater Verified Bater	
	5.12 Total UA Attenative. <sup>14</sup> 5.2 Reduced Thermal Bridging <sup>13</sup> 6 Moisture Risk Limitation 7 Mechanical Ventilation <sup>33</sup> 8 Mechanical Systems						Verified Design Verified Design Verified	Verified Bater Verified Bater Verified	
	5.12 Total UA Alternative <sup>34</sup> 5.2 Reduced Thermal Bridging <sup>23</sup> 6 Moisture Risk Limitation 7 Mechanical Ventilation <sup>33</sup>						Verified Design Verified Design	Verified Bater Verified Bater	
	5.12 Total UA Attenative. <sup>14</sup> 5.2 Reduced Thermal Bridging <sup>13</sup> 6 Moisture Risk Limitation 7 Mechanical Ventilation <sup>33</sup> 8 Mechanical Systems						Verified Design Verified Design Verified Design Verified Design	Verified Bater Verified Bater Verified Bater Bater	
	S.12 Total VA Atematice <sup>14</sup> S.2 Reduced Thermal Bridging <sup>13</sup> Moisture Risk Limitation     Mechanical Ventilation <sup>33</sup> Mechanical Systems     Lighting, Appliances & Water						Verified Design Verified Design Verified Design Verified	Verified Bater Verified Bater Verified Bater Verified	

						Source Zero Renew- able Energy System
					Balanced Ventilation HRV/ERV	Balanced Ventilation HRV/ERV
				SOLAR READY Depends on climate	SOLAR READY ALWAYS	SOLAR READY ALWAYS
				Eff. Comps. & H2O Distrib	Eff. Comps. & H <sub>2</sub> O Distrib	Eff. Comps. & H <sub>2</sub> O Distrib
				EPA Indoor airPLUS	EPA Indoor airPLUS	EPA Indoor airPLUS
				Ducts in Condit. Space	Ducts in Condit. Space	Ducts in Condit. Space
		HVAC QI w/WHV	HVAC QI w/WHV	HVAC QI w/WHV	Micro-load HVAC QI	Micro-load HVAC QI
		Water Management	Water Management	Water Management	Water Management	Water Management
		Independent Verification	Independent Verification	Independent Verification	Independent Verification	Independent Verification
IECC 2009 Enclosure	IECC 2012 Enclosure	IECC 2009 Enclosure	IECC 2012 Enclosure	IECC 2012/15 Encl./ES Win.	Ultra-Efficient Enclosure	Ultra-Efficient Enclosure
HERS <b>85-90</b>	HERS <b>70-80</b>	HERS <b>65-75</b>	HERS 55-65	HERS <b>48-55</b>	HERS <b>35-45</b>	HERS <b>&lt; 0</b>
IECC 2009	IECC 2012	ENERGY STAR v3	ENERGY STAR v3.1	ZERH	<b>o</b> phius	Phius

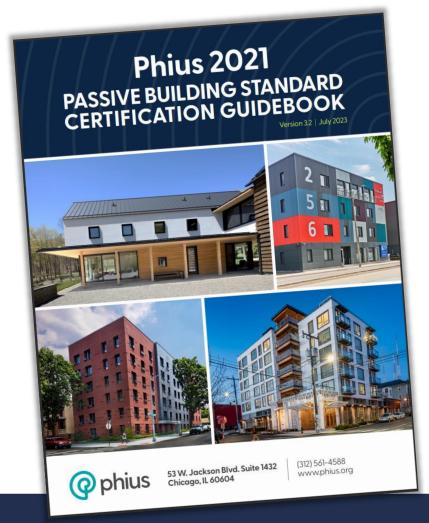
1. Prescriptive Checklist

#### 2. Co-Requisite Requirements

### Resources

(Phius CORE Prescriptive 2021 path from start to plaque)

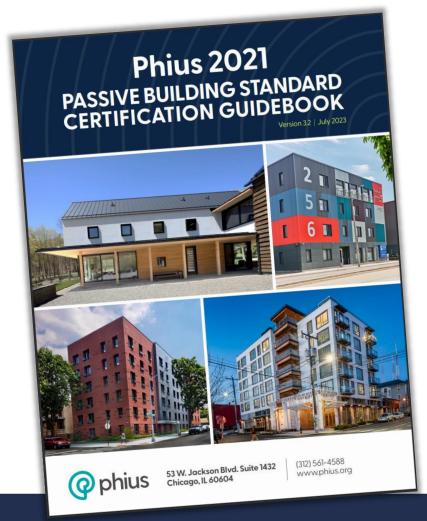
### Phius Certification Guidebook SECTIONS



- 1 About Phius 2021
- 2 General Tips / Guidance
- 3 Building Certification Requirements
- 4- Phius Project Certification Steps
- 5 Phius Project Certification Fee Schedule
- 6 WUFI Passive Energy Modeling Protocol
- 7 Monitoring (optional)
- 8 Additional Certification Badges



### Phius Certification Guidebook SECTIONS



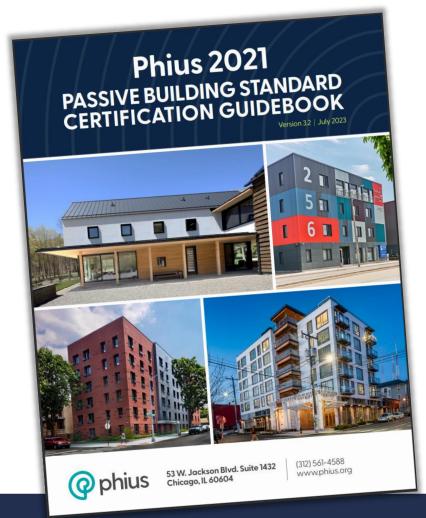
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### Phius Certification Guidebook SECTIONS



- 1 About Phius 2021
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#### Appendix N-7 – Prescriptive Path

- 7 Monitoring (optional)
- 8 Additional Certification Badges



### **Phius Professional Training**



PHASE I: ON-DEMAND PHASE II: 8 LIVE 3-hour SESSIONS



PHASE I: ON-DEMAND PHASE II: 8 LIVE 3-hour SESSIONS



PHASE I: 8 Hrs. ON DEMAND Phase II: 3 LIVE 3-hour SESSIONS \*Pre-Requisite: Must be an active RESNET HERS Rater



PHASE I: 8 Hrs. ON DEMAND Phase II: 3 LIVE 3-hour SESSIONS

\*Pre-Requisite: Must be an active RESNET HERS Rater to earn the Multifamily Designation

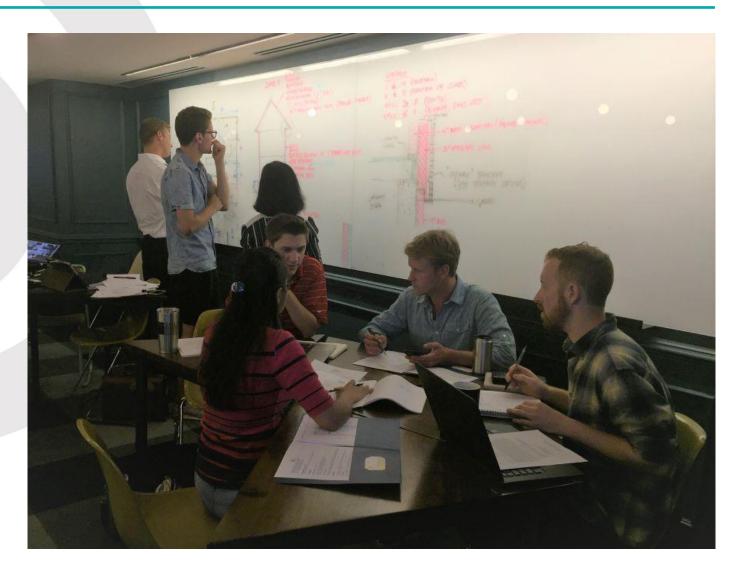


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### Phius CORE Prescriptive path workshop

#### **Phius CORE Prescriptive path workshop** 4 Hours Total

-Program overview -Deep dive into checklist -Work on a sample project



### **Phius** Prescriptive Path 101



### Prescription for Better Buildings, Faster