DesignPH – 08: Analyze & Export

Webinar. October 20, 2020

NYPH NEW YORK PASSIVE HOUSE

bldgtyp

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designPH

Ed May | Partner, Building-Type, LLC

(architect, passive house consultant, teacher)

DESIGNER CERTIFIED PASSIVE HOUSE DESIGNER · CPHC · LEED GREEN ASSOCIATE · PASSIVEHOUSE CANADA · naphn · NYPH NEW YORK PASSIVE HOUSE · PHA Passive House Academy · STEVENS · PARSONS

2 / 49

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NYPH 2020 Technical Workshops

DesignPH | SketchUp | PHPP | Ventilation

	DesignPH 2.0 A Powerful Tool	NYPH Members	General Admission	PHI CEUs
	MODULE 01 | BASIC | FOR EVERYONE			
May 19th	01_Workflow: Modeling, Required Tools	Free	$ 15	1.0 EC
June 2nd	02_Solar: Location, Orientation, Axes, Shadow	Free	$ 15	1.0 EC
	MODULE 02 | ADVANCED | FOR PASSIVE HOUSE DESIGNERS			
June 16th	03_Face Assignments: Exposure Type, U-Values, Creating Assemblies	Free	$ 15	TBD
June 30th	04_Face Assignments: Below Grade, Shading Context, Non-Thermal Faces	Free	$ 15	TBD
July 21st	05_Assignments: Thermal Bridge, TFA Surface	Free	$ 15	TBD
Sept 22nd	06_Window: Modeling, Components, Mullions and Reveals	Free	$ 15	TBD
Oct 6th	07_Window: Editing and Adjusting, Curtain Walls, Shading	Free	$ 15	TBD
	MODULE 03 | PROFESSIONAL | FOR ENERGY MODELERS			
Oct 20th	08_Analysis: Run Simulations, Results Tracker	TBD	$ 15	TBD
	09_Shading: Analyzing Window Radiation, Fixed and Irregular Shading	TBD	$ 15	TBD
	10_PHPP: Exporting HBR File, Importing PPP File, Finish off the model in PHPP	TBD	$ 15	TBD

3 / 49

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Agenda [1 hour]

- DesignPH Review
- Analyze!
- Export to PHPP

4 / 49

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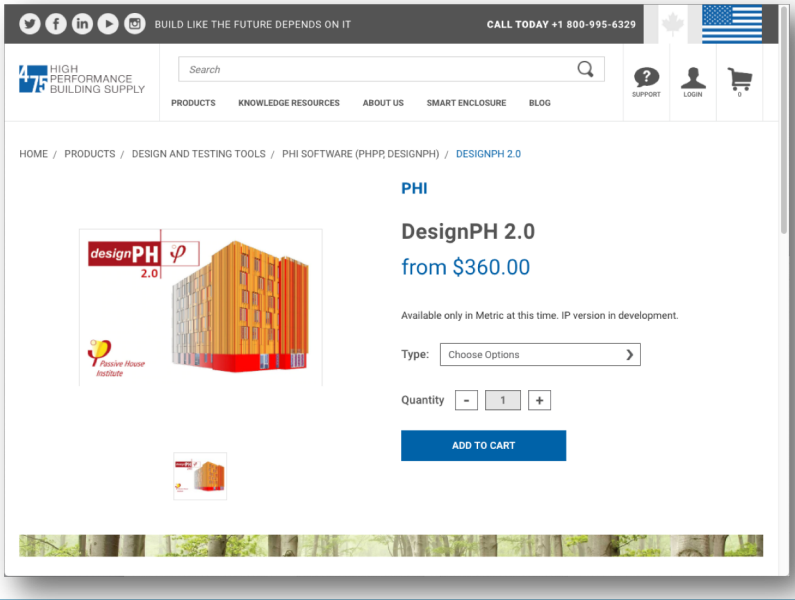
DesignPH Review

Requirements

What you'll need:

- A copy of the DesignPH 2.0 plugin
- Sketchup 3-D modeling software
- A copy of the PHPP v.8 or 9 (and Excel)

https://foursevenfive.com/designph-2-0/



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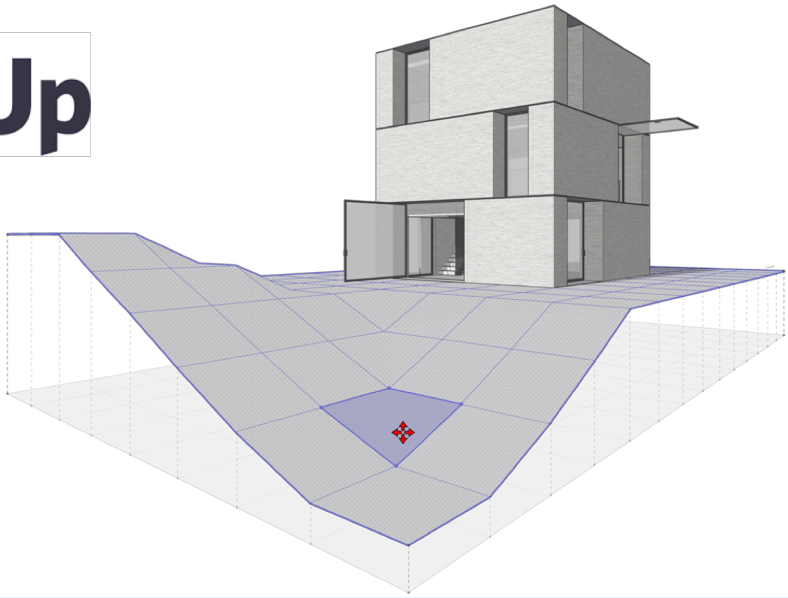
Sketchup



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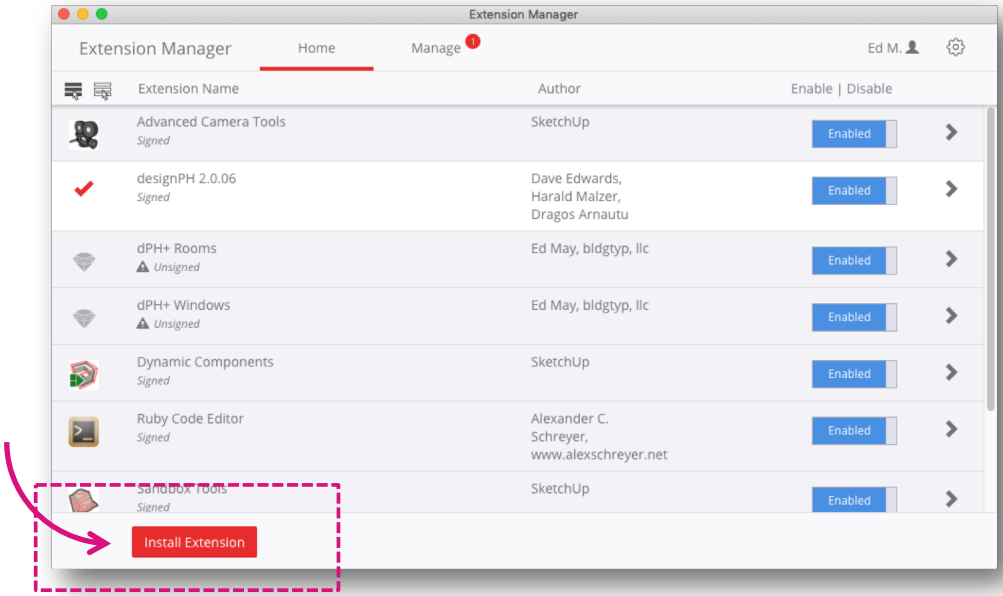
Sketchup Extensions Manager



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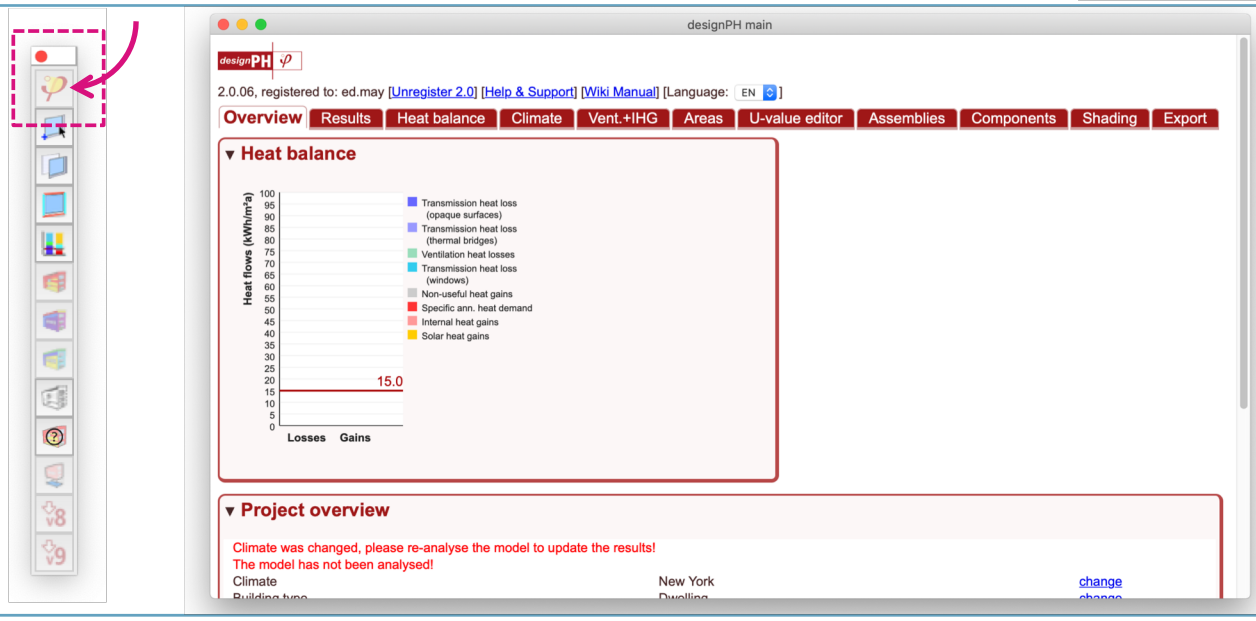
Start DesignPH Plugin [Each time you run Sketchup]



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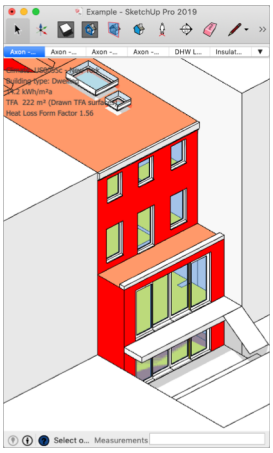
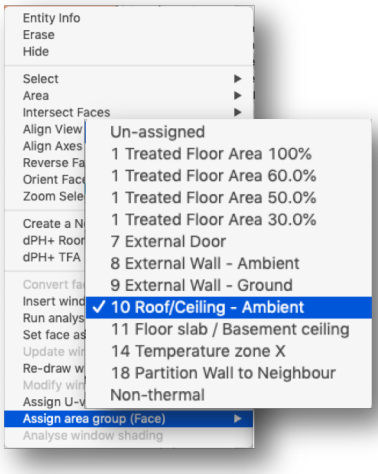
DesignPH Workflow

1) Model Geometry



2) Tag Model Geometry w/ Data



3) Analyze

4) Export

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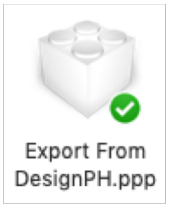
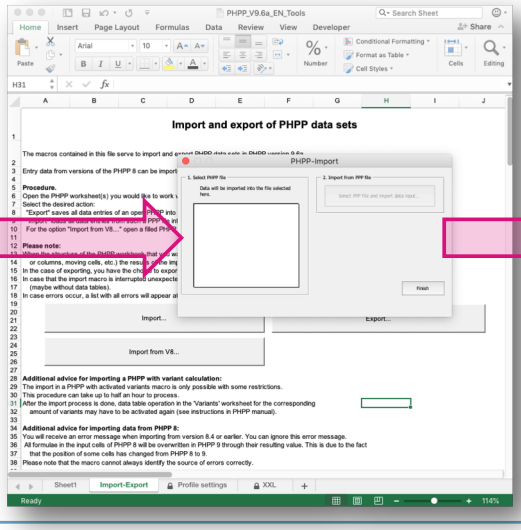
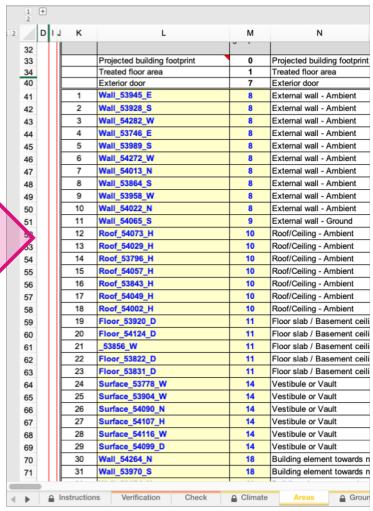
DesignPH Workflow



5) Import



6) Complete the PHPP



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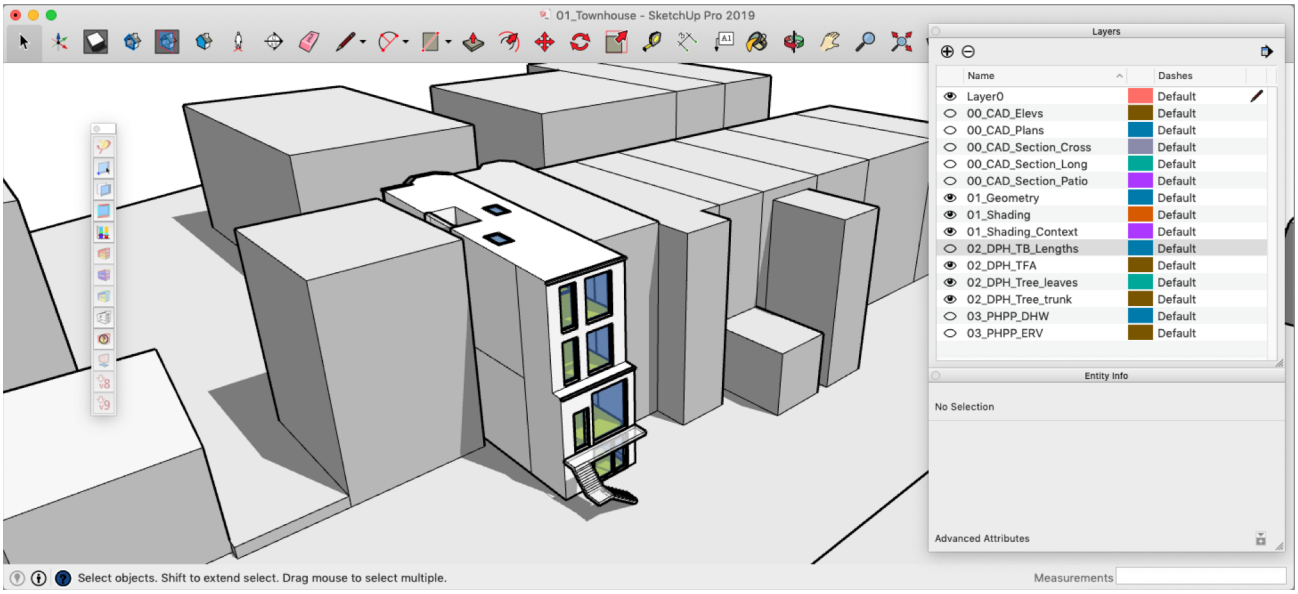
Analyze

We're finally ready to Analyze!



14 / 49

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- ☑ Surfaces Modeled
- ☑ U-Values Assigned
- ☑ Windows Modeled
- ☑ Components Assigned
- ☑ Shading Modeled
- ☑ Model North Oriented Correctly
- ☑ TFA Modeled, Factors Assigned

15 / 49

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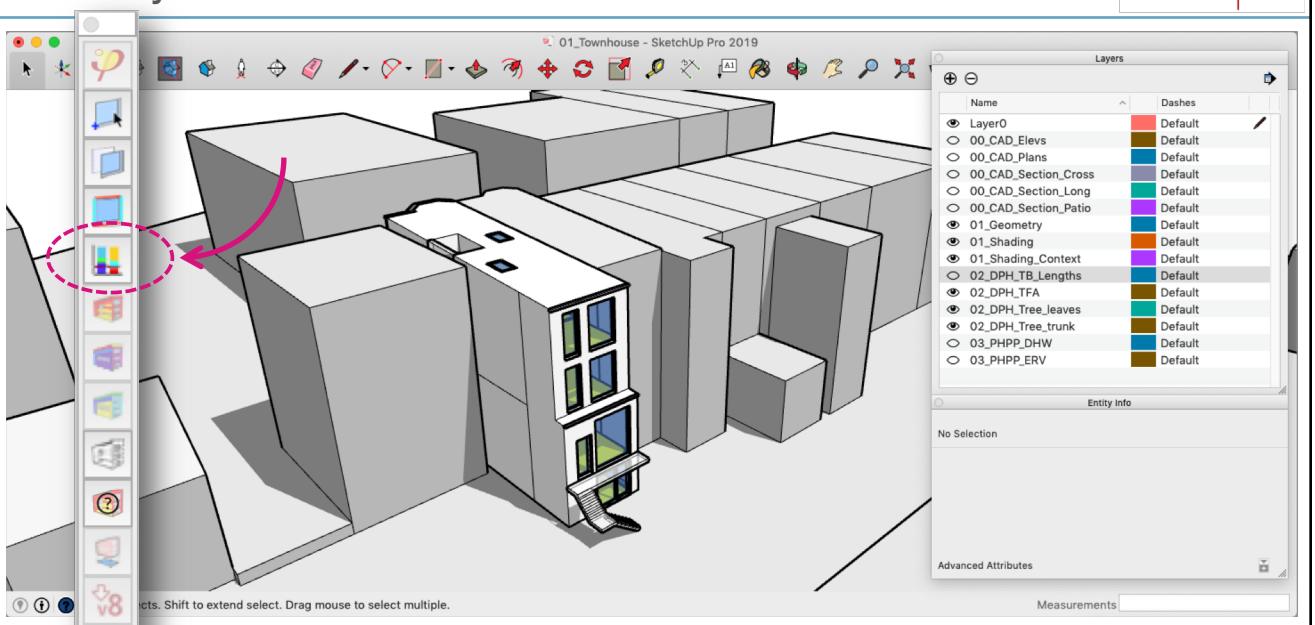
Analyze!



16 / 49

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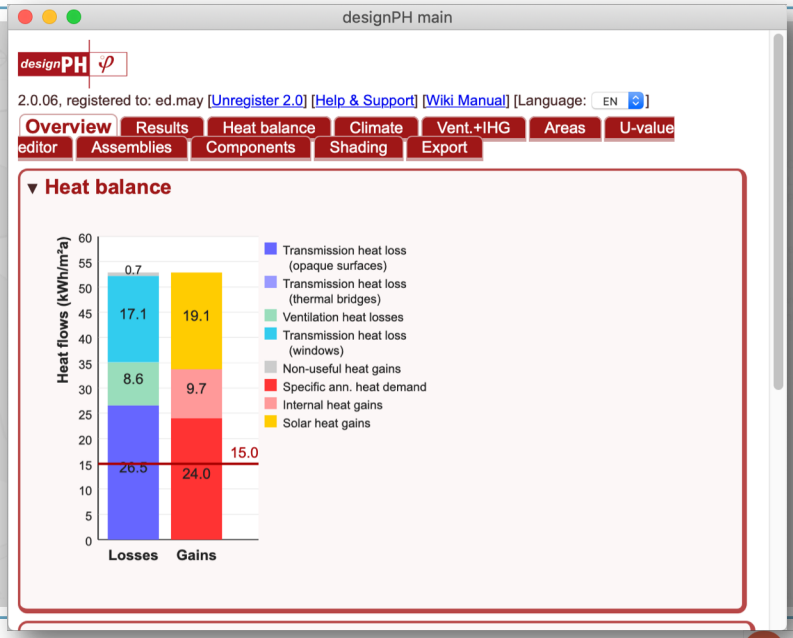
Results!



17 / 49

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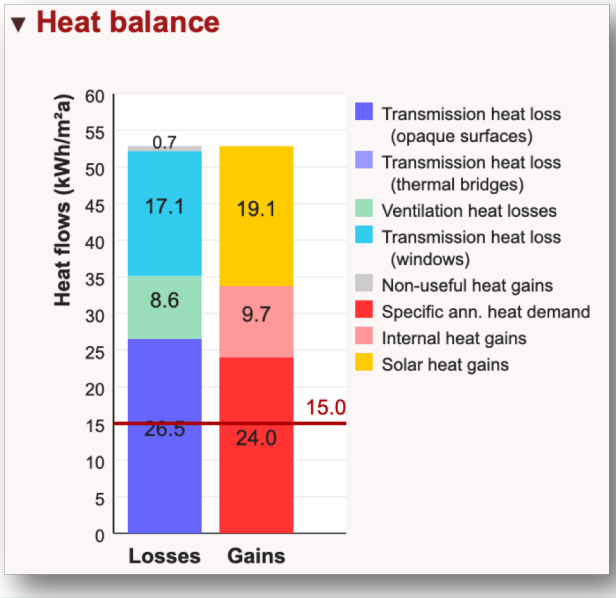
Things to keep in mind…..

- This is for winter ONLY, no cooling (yet)
- We have not (yet) set the climate
- We have not (yet) set any ventilation information
- We have not (yet) set the shading resolution



18 / 49

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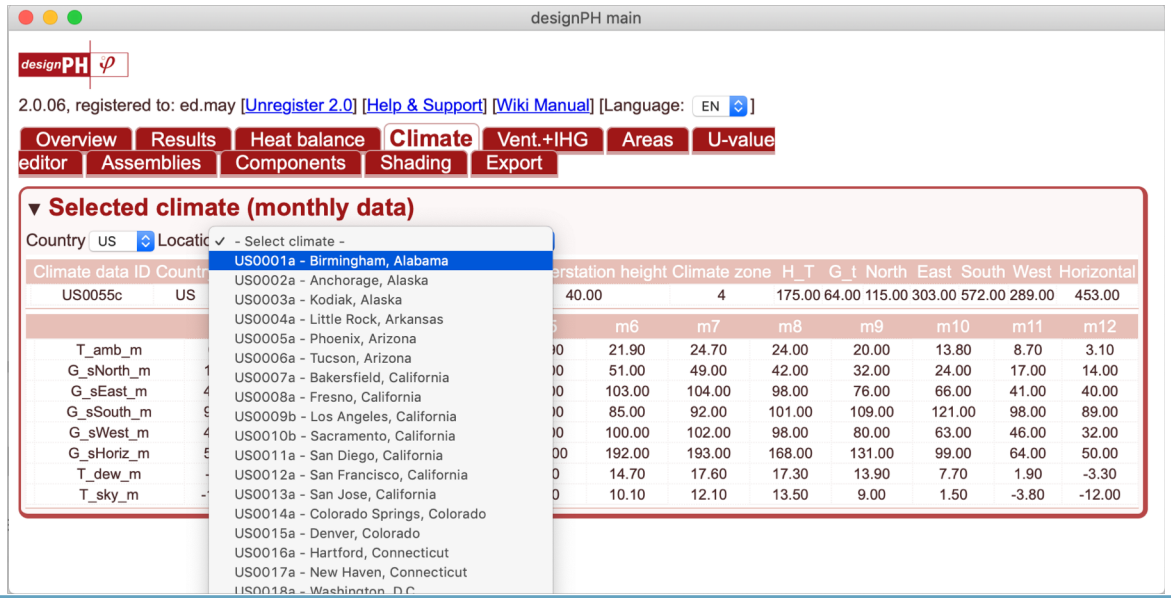
1) Set the Climate



19 / 49

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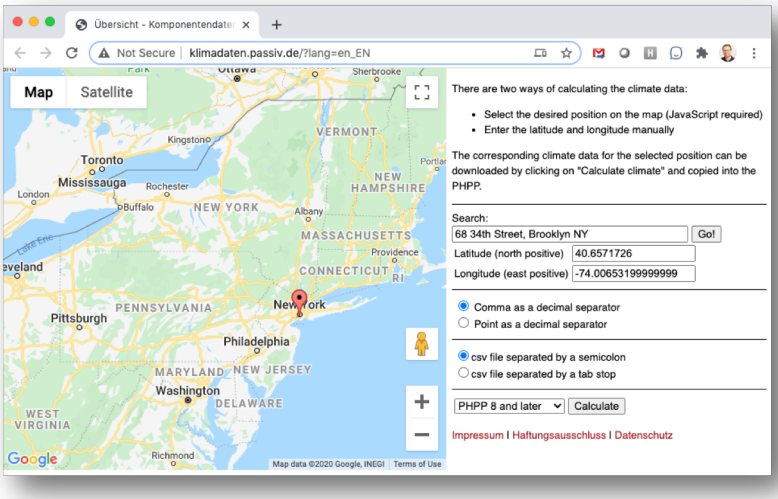
1) Set the Climate: Custom ?



No functionality to import / set custom climates in DesignPH yet. If you are using custom climates from PHI, you'll have to enter it in the PHPP AFTER you export in the later steps. For now, set your model to the closest location you can find in the list.

20 / 49

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2) Ventilation

Overview | Results | Heat balance | Climate | Vent.+IHG | Areas | U-value
editor | Assemblies | Components | Shading | Export

Ventilation & Internal Heat Gains - inputs

▾ Ventilation heat losses

Select ventilation type: 1 - Balanced PH ventilation with HR

Select ventilation unit: 97ud - [75.0%] Default: PH minimum HR

vent_sys_ID	vent_type_ID	Room height, (m)	Net air volume for pressure test, V_{n50} (m³)	Air change rate at pressure test, n50 (1/h)	Wind protection coeff., e	Wind protection coeff., f
97ud	1	2.5	740.1	1.0	0.07	15.0

Room height, (m)	Treated Floor Area (m²)	Ventilation volume, V_v (m³)	Net air volume for pressure test, V_{n50} (m³)	Air change rate at pressure test, n50 (1/h)	Wind protection coeff., e	Wind protection coeff., f
2.50	243.33	608.33	740.10	1.00	0.07	15.00

Design air flow rate (m³/h)	V_dot_av	Average air change rate (1/h)	vent_n_v_ex	Heat recovery efficiency	eta_HR_eff
237.25	182.68	0.30	0	0.75	0.74

21 / 49

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2) Ventilation: Custom HRV?

Overview | Results | Heat balance | Climate | Vent.+IHG | Areas | U-value
editor | Assemblies | Components | Shading | Export

Ventilation & Internal Heat Gains - inputs

▾ Ventilation

Select ventilation ty

Select ventilation ur

-Select option-
01ud - [70.0%] Example: poor HR
02ud - [85.0%] Example: good HR
✓ 97ud - [75.0%] Default: PH minimum HR
0918vs03 - [77.0%] Airflow Developments Limited - DV245 Adroit
0913vs03 - [86.0%] Airflow Developments Limited - DV50 Adroit
0916vs03 - [86.0%] Airflow Developments Limited - DV110 Adroit
0917vs03 - [88.0%] Airflow Developments Limited - DV145 Adroit
0914vs03 - [84.0%] Airflow Developments Limited - DV80 Adroit
0915vs03 - [84.0%] Airflow Developments Limited - DV96 Adroit
0960vs03 - [88.0%] Airflow Developments Limited - DV300 Entro
0959vs03 - [85.0%] Airflow Developments Limited - DV250 Entro
0961vs03 - [88.0%] Airflow Developments Limited - DV400 Entro
1264vs03 - [83.0%] ALDES Aéraulique - InspirAIR Home SC150
0780vs03 - [77.0%] ALDES Aéraulique - Dee Fly Cube 300

22 / 49

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2) Ventilation: Volume

Overview | Results | Heat balance | Climate | Vent.+IHG | Areas | U-value
editor | Assemblies | Components | Shading | Export

Ventilation & Internal Heat Gains - inputs

▾ Ventilation heat losses

Select ventilation type: 1 - Balanced PH ventilation with HR

Select ventilation unit: 97ud - [75.0%] Default: PH minimum HR

vent_sys_ID	vent_type_ID	Room height, (m)	Net air volume for pressure test, V_{n50} (m³)	Air change rate at pressure test, n50 (1/h)	Wind protection coeff., e	Wind protection coeff., f
97ud	1	2.5	740.1	1.0	0.07	15.0

Room height, (m)	Treated Floor Area (m²)	Ventilation volume, V_v (m³)	Net air volume for pressure test, V_{n50} (m³)	Air change rate at pressure test, n50 (1/h)	Wind protection coeff., e	Wind protection coeff., f
2.50	243.33	608.33	740.10	1.00	0.07	15.00

Design air flow rate (m³/h)	V_dot_av	Average air change rate (1/h)	vent_n_v_ex	Heat recovery efficiency	eta_HR_eff
237.25	182.68	0.30	0	0.75	0.74

23 / 49

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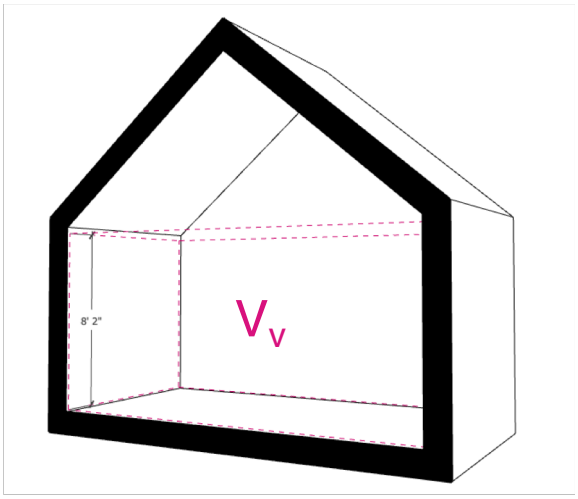
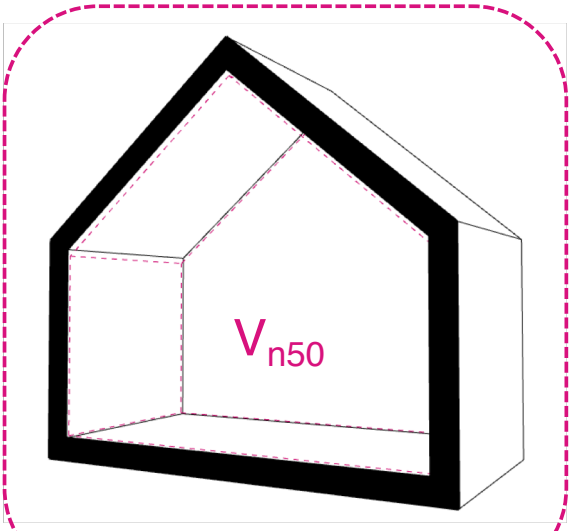
2 Different Reference Volumes



'Breathable Air' Zone (TFA x 8.2')



Actual Net Interior Volume

24 / 49

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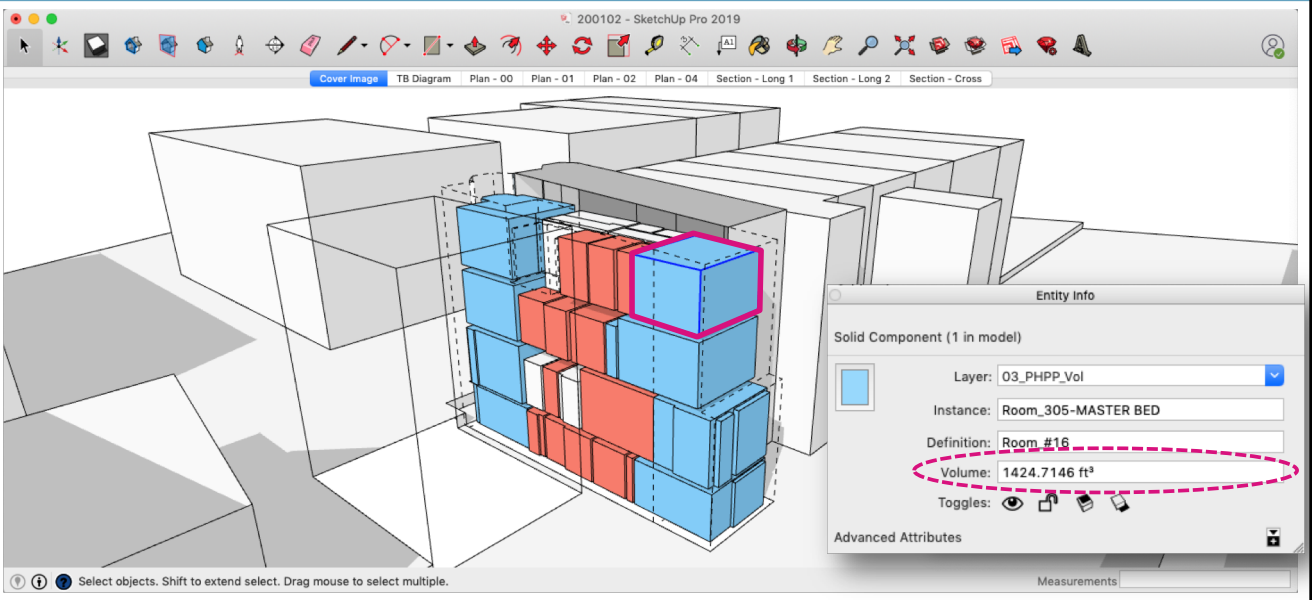
2) Ventilation: Volume



25 / 49

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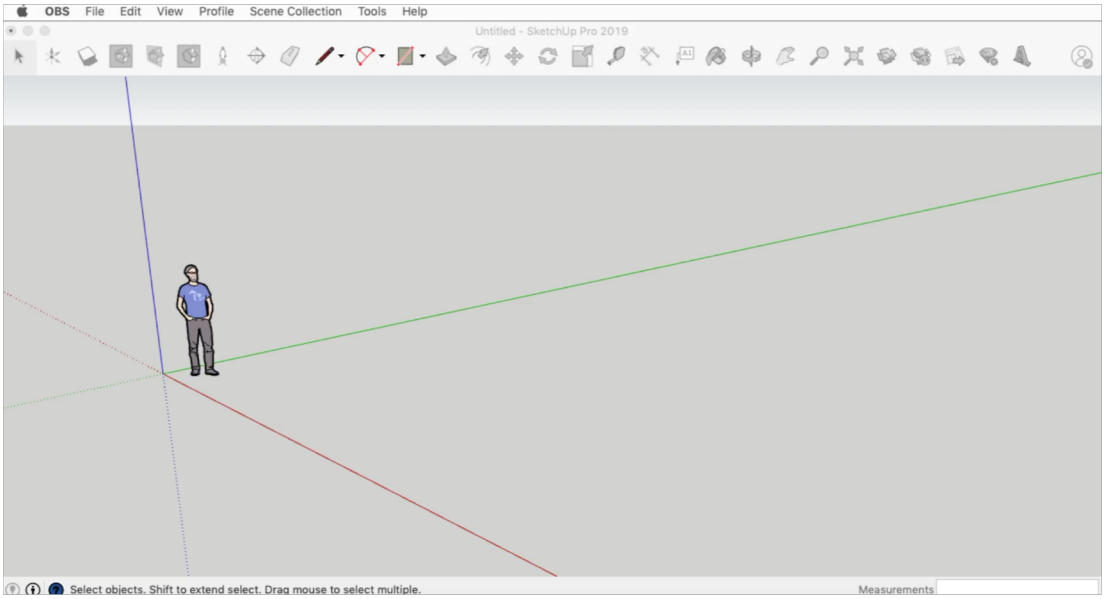
Room-Data Plugin [Not Part of DesignPH]



26 / 49

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Room-Data Plugin [Not Part of DesignPH]

RoomData.csv — Open with Microsoft Excel

SKP-PID	Zone	Floor	Room Num	Amount	Room Name	Allocation to Vent	Area (m2)	Vv Reference Height (m)	V-Sup (m3/h)	V-Eta
351594	0-COMMERCIAL	0-CELLAR	000	1	0-COMMERCIAL_FL-0-CELLAR_ 000-STAIR	1	0.0	0.0	0.0	0.0
351596	0-COMMERCIAL	0-CELLAR	000	1	0-COMMERCIAL_FL-0-CELLAR_ 000-FIRE PASSAGE	1	16.4	2.5	0.0	0.0
351590	0-COMMERCIAL	0-CELLAR	000	1	0-COMMERCIAL_FL-0-CELLAR_ 000-STORAGE	1	4.08	2.5	0.0	0.0

Amount a	Room name	Allocation to ventilation unit (No.)	Area A m²	Clear height h m	Room vol. A x h m³	Volume flow per room V_{SUP} m³/h	V_{ETA} m³/h	V_{TRANS} m³/h	Air chr per ro 1/h
0	0-COMMERCIAL_FL-0-CELLAR_ 000-STAIR	1	0.0	0.00		0	0	0	
0	0-COMMERCIAL_FL-0-CELLAR_ 000-FIRE PASSAGE	1	16.4	2.50		0	0	0	
0	0-COMMERCIAL_FL-0-CELLAR_ 000-STORAGE	1	4.1	2.50		0	0	0	
0	0-COMMERCIAL_FL-0-CELLAR_ 000-FIRE STAIR	1	0.0	0.00		0	0	0	
0	0-COMMERCIAL_FL-0-CELLAR_ C03-MECH ROOM / STOR	1	14.6	2.50		0	127	0	
0	0-COMMERCIAL_FL-0-CELLAR_ C04-ELEV. MACHINE ROOM	1	0.0	0.00		0	255	0	
0	0-COMMERCIAL_FL-0-CELLAR_ C07-WC	1	2.8	2.50		0	127	0	
0	0-COMMERCIAL_FL-0-CELLAR_ C08-COMMUNITY FACILITY	1	67.8	2.50		85	0	0	
0	0-COMMERCIAL_FL-0-CELLAR_ C10-MECH CLOSET	1	2.6	2.50		0	0	0	
0	0-COMMERCIAL_FL-01_ 100-VESTIBULE	1	0.0	0.00		0	0	0	
0	0-COMMERCIAL_FL-01_ 101-CELLAR ACCESS	1	0.0	0.00		0	0	0	
0	0-COMMERCIAL_FL-01_ 106-WC	1	0.0	0.00		0	127	0	
0	0-COMMERCIAL_FL-01_ 107-COMMUNITY FACILITY	1	91.6	2.50		136	0	0	
0	1-RES-COMMON_FL-0-CELLAR_ 000-ELEV	2	0.0	0.00		0	0	0	

omponents | Windows | Shading | Ventilation | Additional Vent | Annual heating | Heating | Heating Load | SummVent | Cooling | Cooling units | Cooling load

27 / 49

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2) Ventilation: Airchange Rate @ 50Pa

Overview | Results | Heat balance | Climate | Vent.+IHG | Areas | U-value
editor | Assemblies | Components | Shading | Export

Ventilation & Internal Heat Gains - inputs

▾ Ventilation heat losses

Select ventilation type: 1 - Balanced PH ventilation with HR

Select ventilation unit: 97ud - [75.0%] Default: PH minimum HR

vent_sys_ID	vent_type_ID	Room height, (m)	Net air volume for pressure test, V_{n50} (m³)	Air change rate at pressure test, n50 (1/h)	Wind protection coeff., e	Wind protection coeff., f
97ud	1	2.5	740.1	1.0	0.07	15.0

Room height, (m)	Treated Floor Area (m²)	Ventilation volume, V_v (m³)	Net air volume for pressure test, V_{n50} (m³)	Air change rate at pressure test, n50 (1/h)	Wind protection coeff., e	Wind protection coeff., f
2.50	243.33	608.33	740.10	1.00	0.07	15.00

Design air flow rate (m³/h)	V_dot_av	Average air change rate (1/h)	vent_n_v_ex	Heat recovery efficiency	eta_HR_eff
237.25	182.68	0.30	0	0.75	0.74

28 / 49

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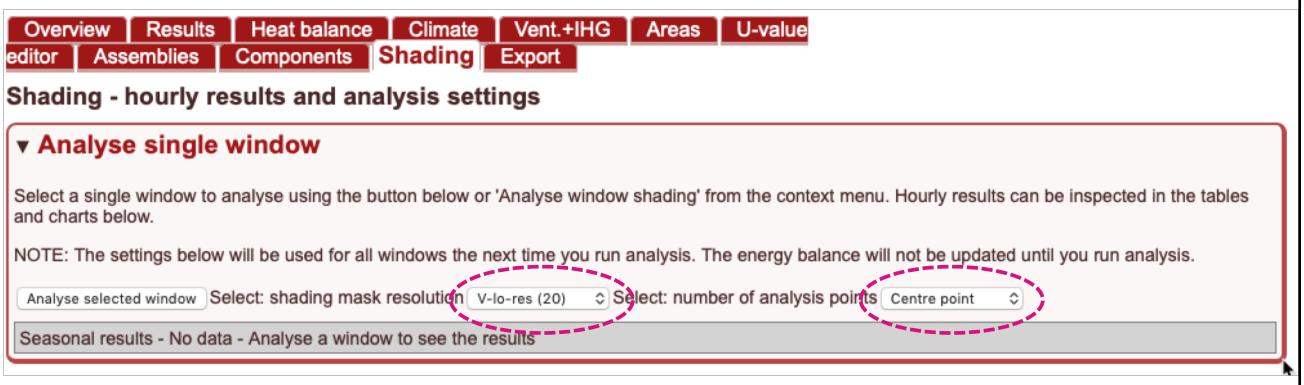
3) Shading Resolution



The settings here will be applied to ALL windows during analysis run. Be careful with using very high resolutions as it can lead to very long calculation times.

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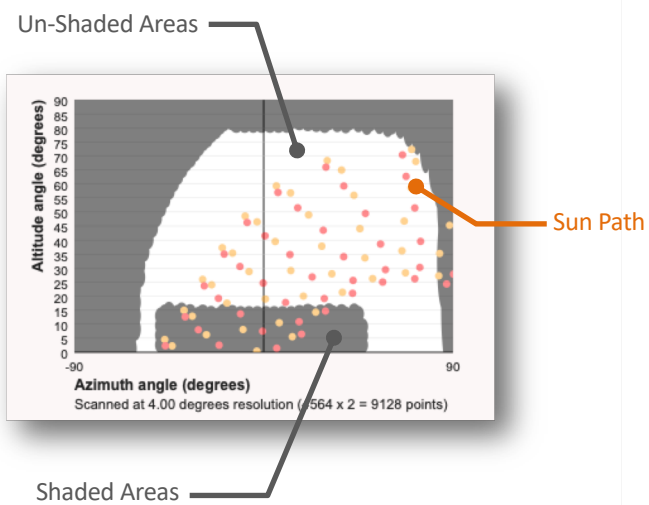
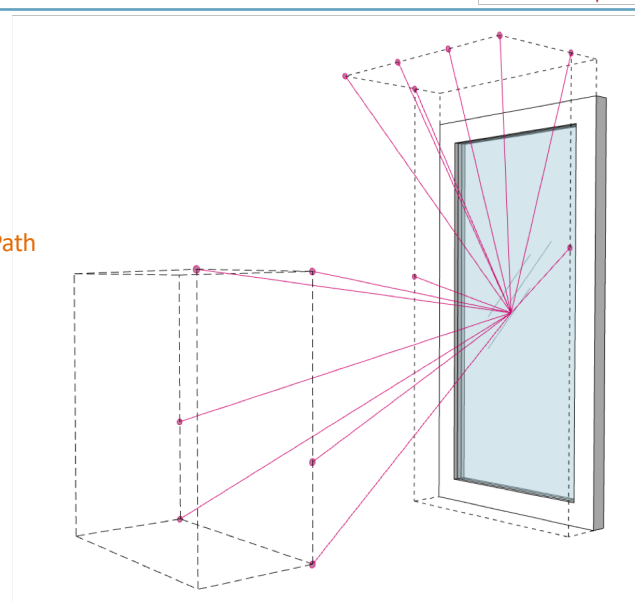
DesignPH 2.0 Shading Masks





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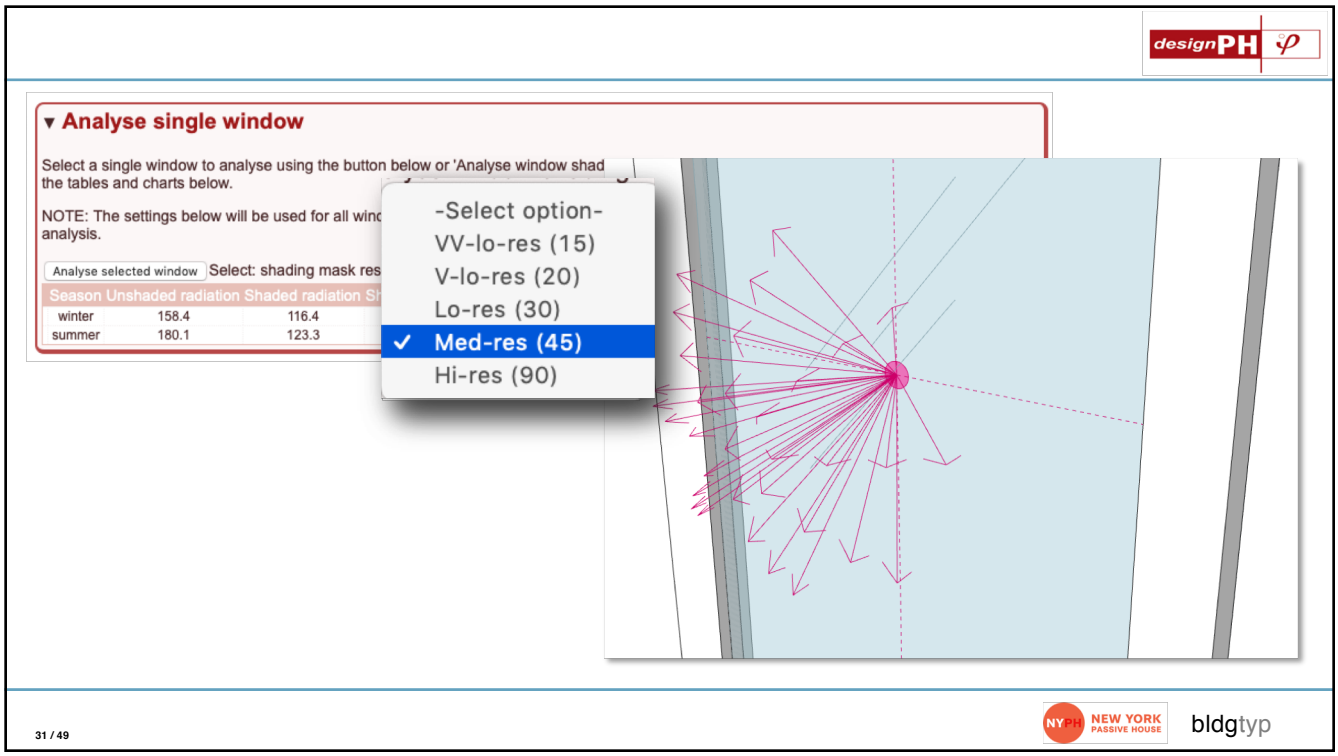
designPH
Analyse single window
Select a single window to analyse using the button below or 'Analyse window shad
the tables and charts below.
NOTE: The settings below will be used for all windows
analysis.
Analyse selected window
Select: shading mask res
Season Unshaded radiation Shaded radiation
winter 158.4 116.4
summer 180.1 123.3
-Select option-
VV-lo-res (15)
V-lo-res (20)
Lo-res (30)
Med-res (45)
Hi-res (90)
31 / 49
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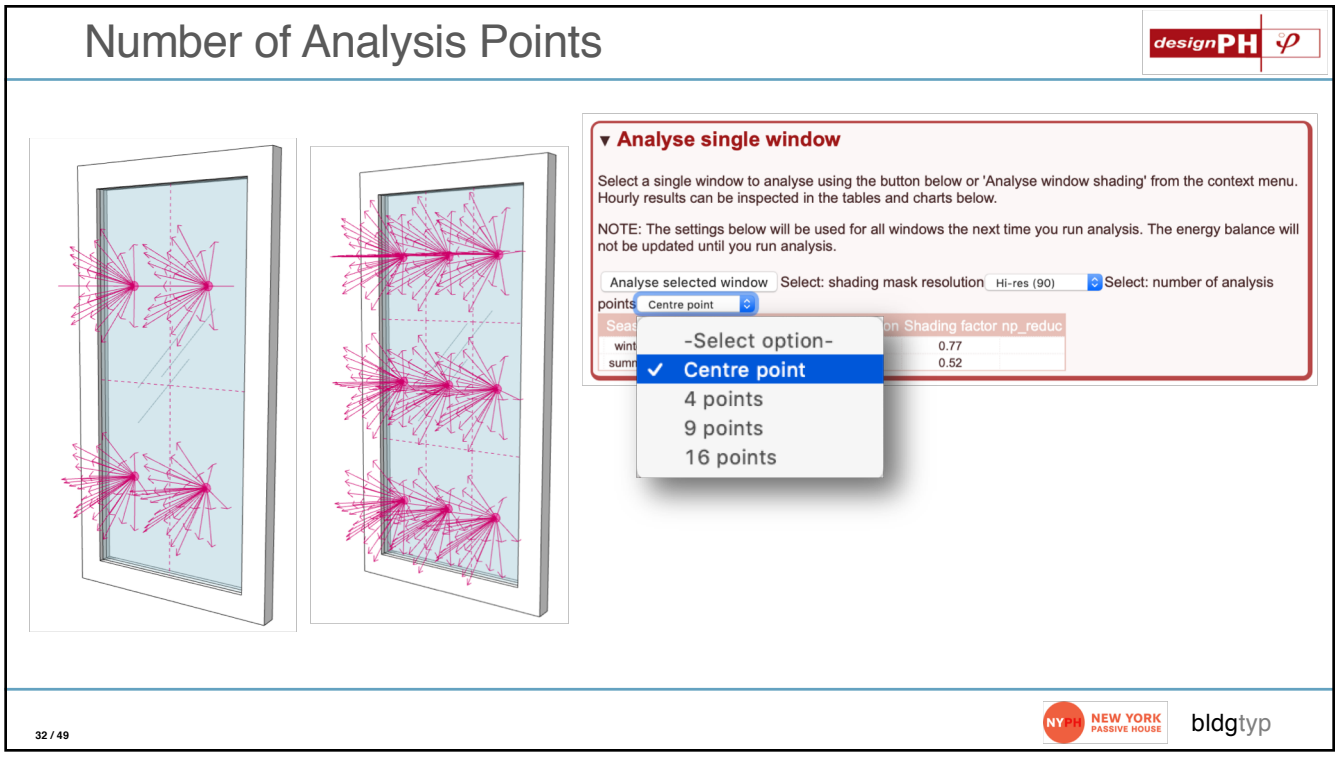
Number of Analysis Points
designPH
Analyse single window
Select a single window to analyse using the button below or 'Analyse window shading' from the context menu.
Hourly results can be inspected in the tables and charts below.
NOTE: The settings below will be used for all windows the next time you run analysis. The energy balance will
not be updated until you run analysis.
Analyse selected window
Select: shading mask resolution
Hi-res (90)
Select: number of analysis
points
Centre point
Shading factor np_reduc
0.77
0.52
-Select option-
Centre point
4 points
9 points
16 points
32 / 49
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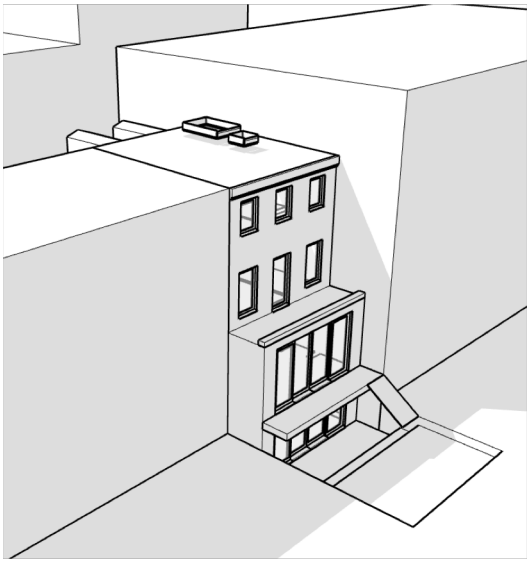
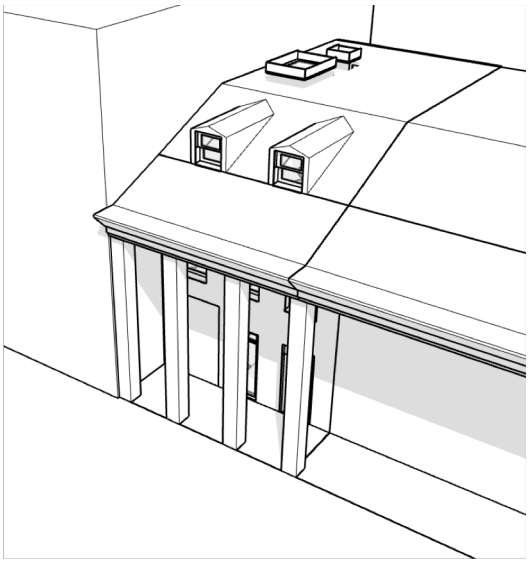
Example I Brooklyn NY Rowhouse [37 windows]





33 / 49

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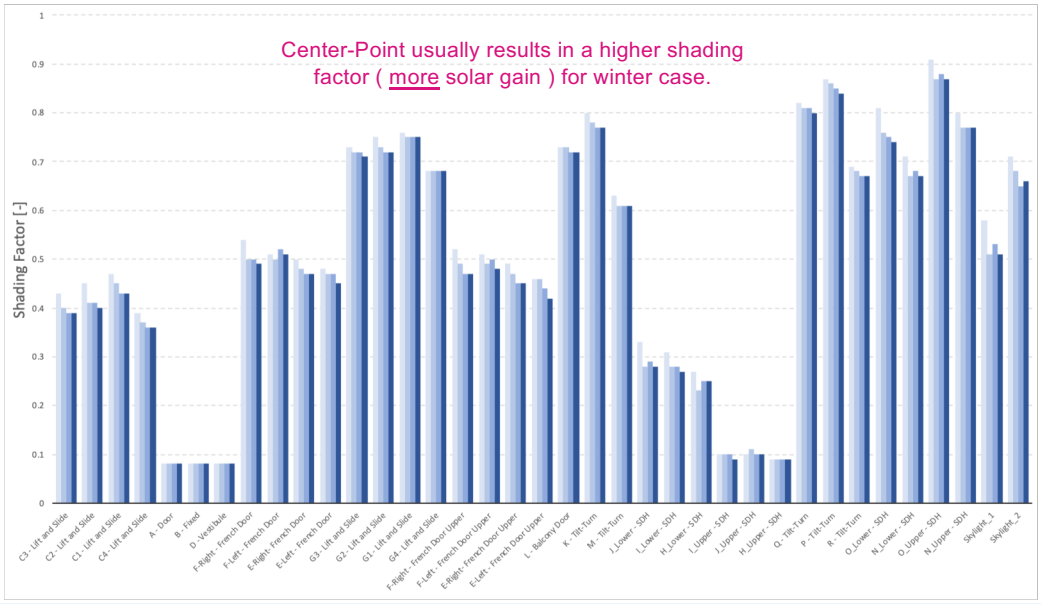
Example I Brooklyn NY Rowhouse I WINTER

Center
4 point
9 point
16 point



34 / 49

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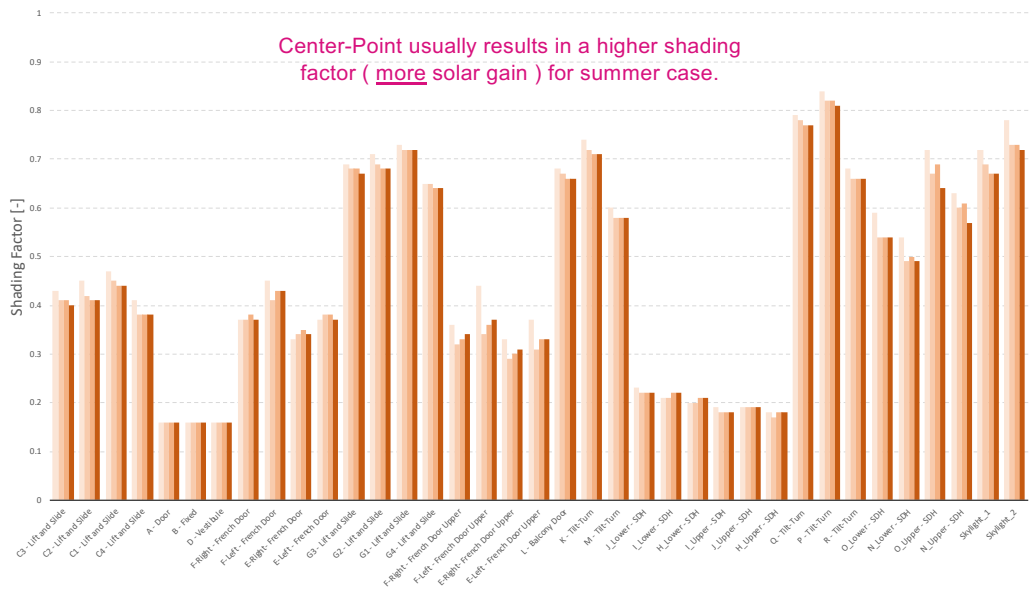
Example I Brooklyn NY Rowhouse I Summer

Center
4 point
9 point
16 point



35 / 49

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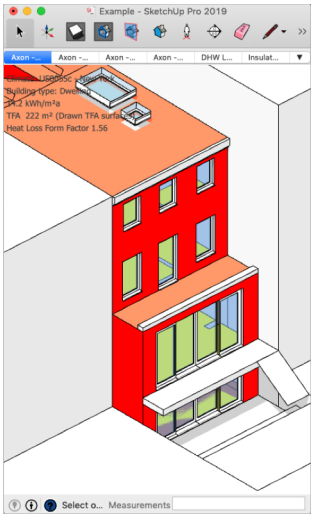
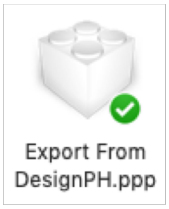
Export to PHPP

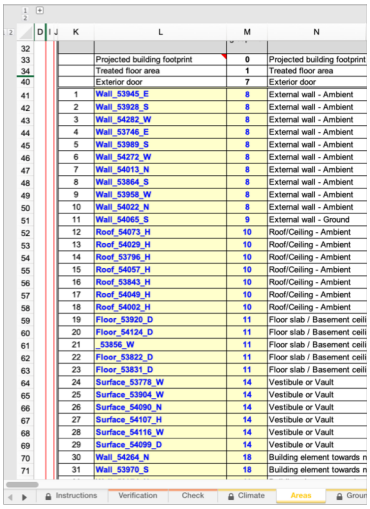
DesignPH

.PPP File

New PHPP







37 / 49

NEW YORK PASSIVE HOUSE

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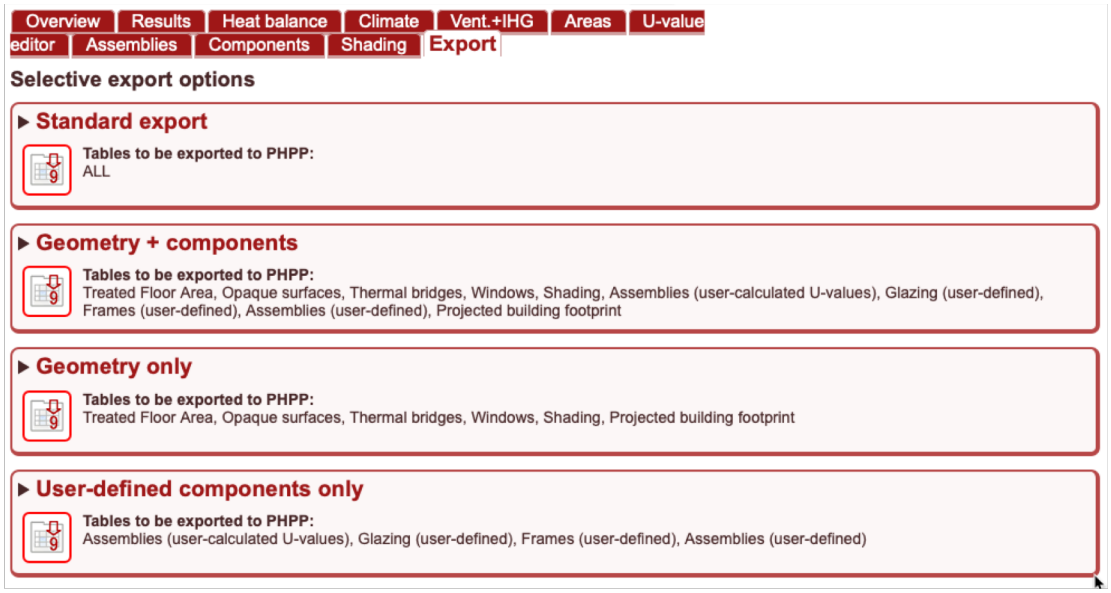
4 Export Levels



38 / 49

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IP PHPP ? [https://designph.org/FAQ]

FAQ

This article contains **Frequently Asked Questions (FAQ)** concerning the time prior to purchasing ***designPH***.

- **Is there an IP (US Imperial Units) version of designPH?**

  Users of the PHPP-IP version can enable the designPH-IP export modes by activating designPH using their PHPP-IP registration code received from the reseller. A minimum of designPH v1.1.50 is required for compatibility with PHPP_IPv9. The calculation and data-entry in designPH itself remains in metric units.

39 / 49

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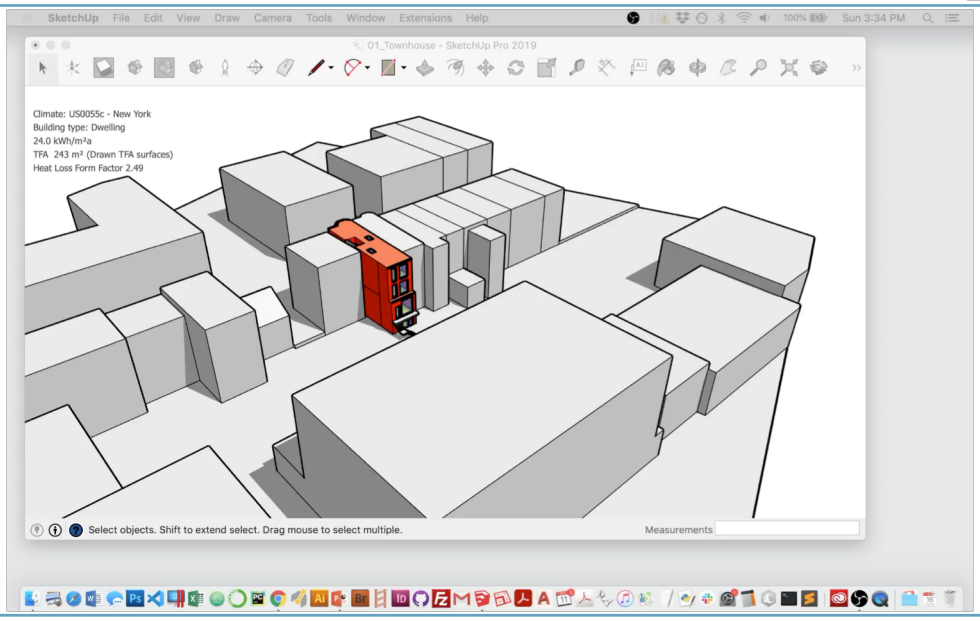
Step 1) Save Out your .PPP File



40 / 49

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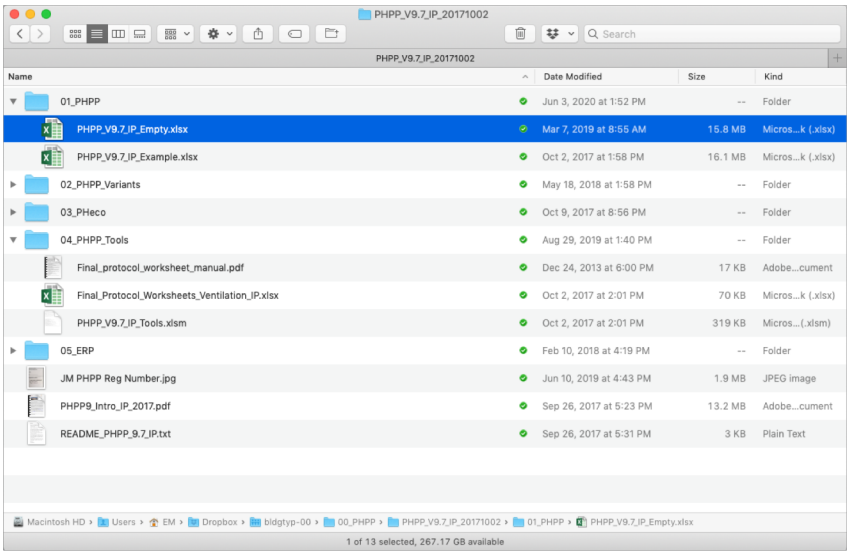
Step 2) Open a NEW blank PHPP Copy

Make a NEW Copy



41 / 49

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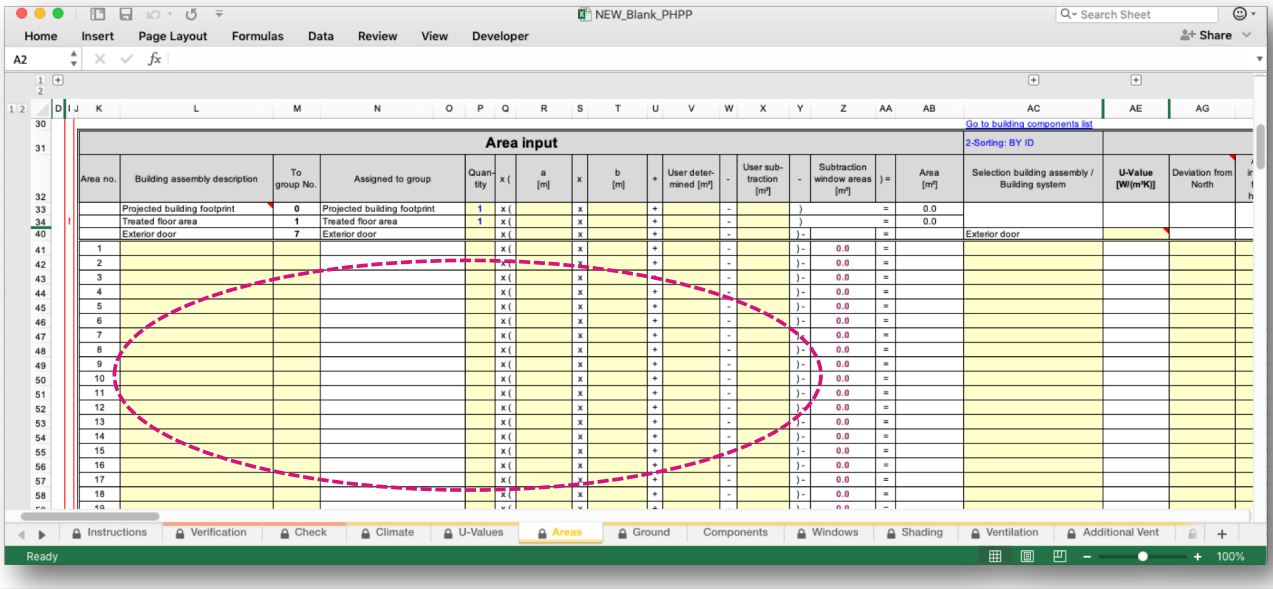
Step 3) Open the New (Blank) PHPP Copy



42 / 49

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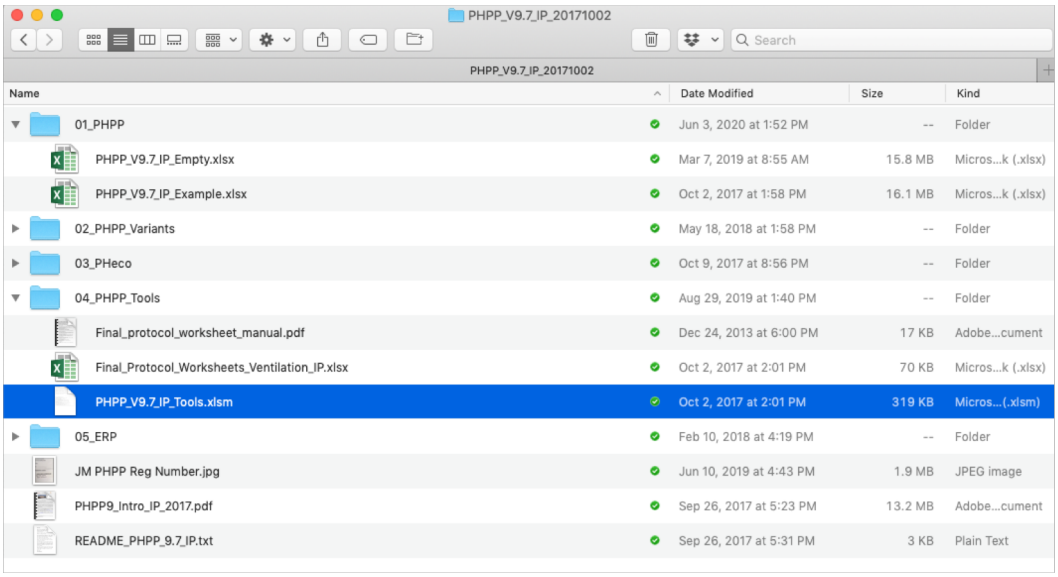
Step 4) Open the PHPP_V9.7_IP_Tools.xlsm



43 / 49

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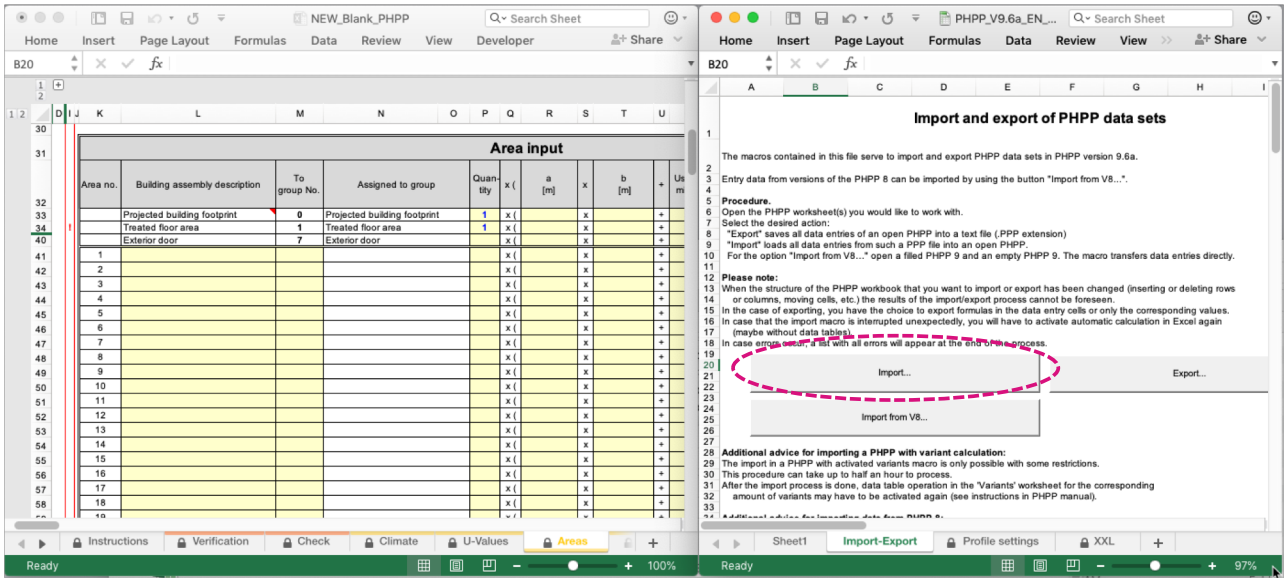
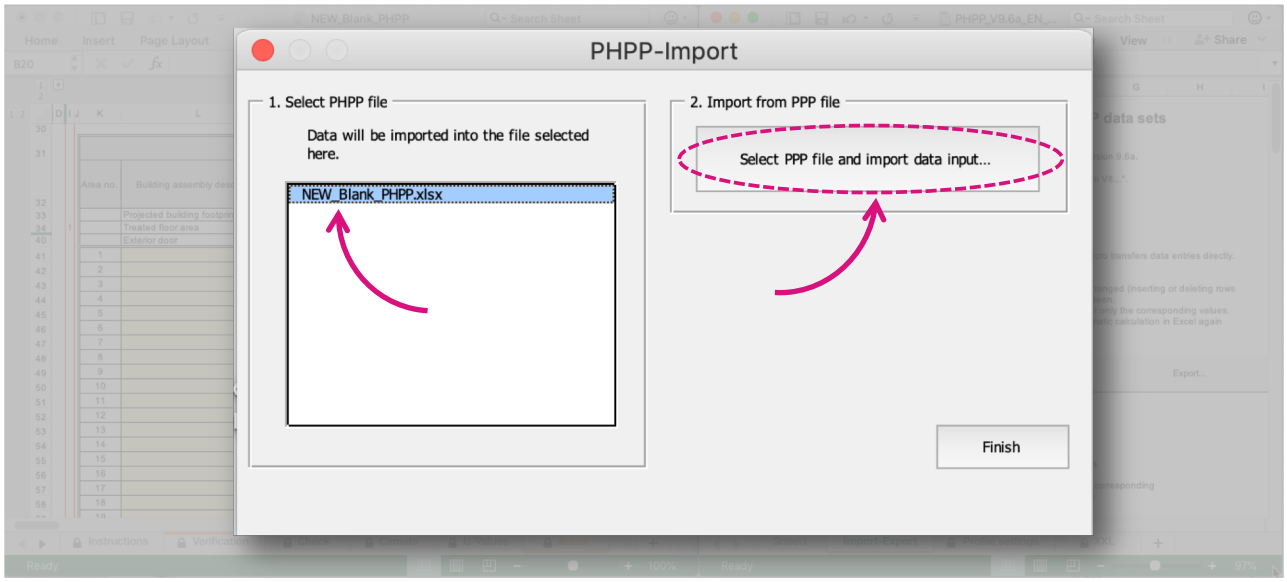
Blank PHPP AND Tools.xlsm Open at the Same Time



44 / 49

NEW YORK PASSIVE HOUSE bldgtyp



45 / 49

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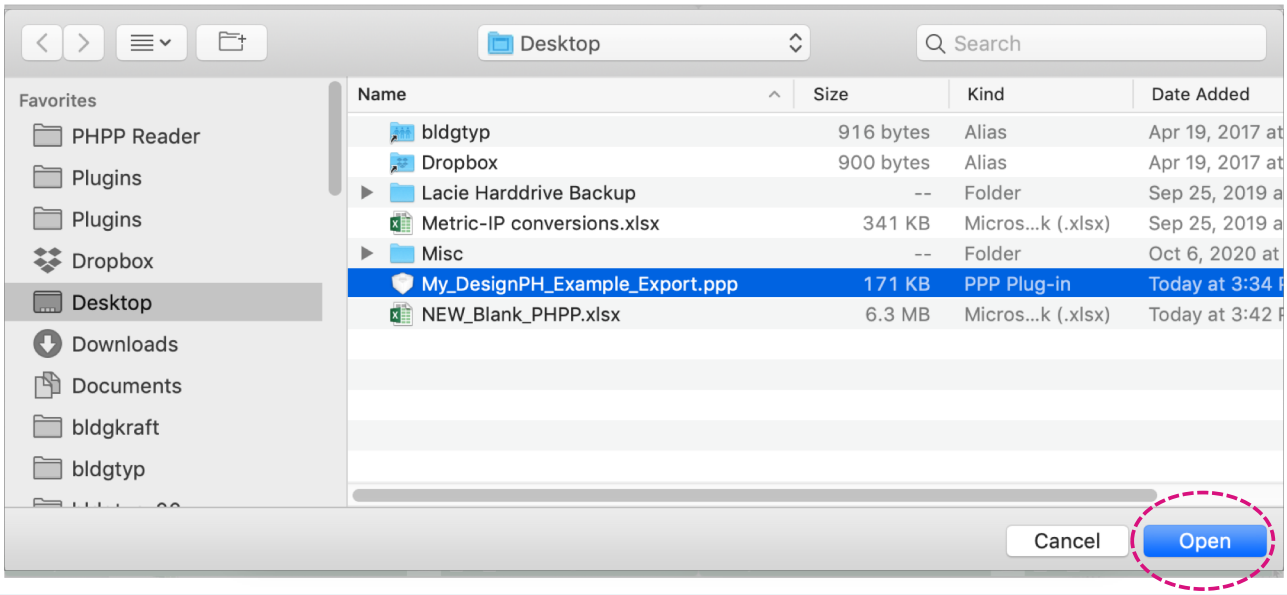

46 / 49

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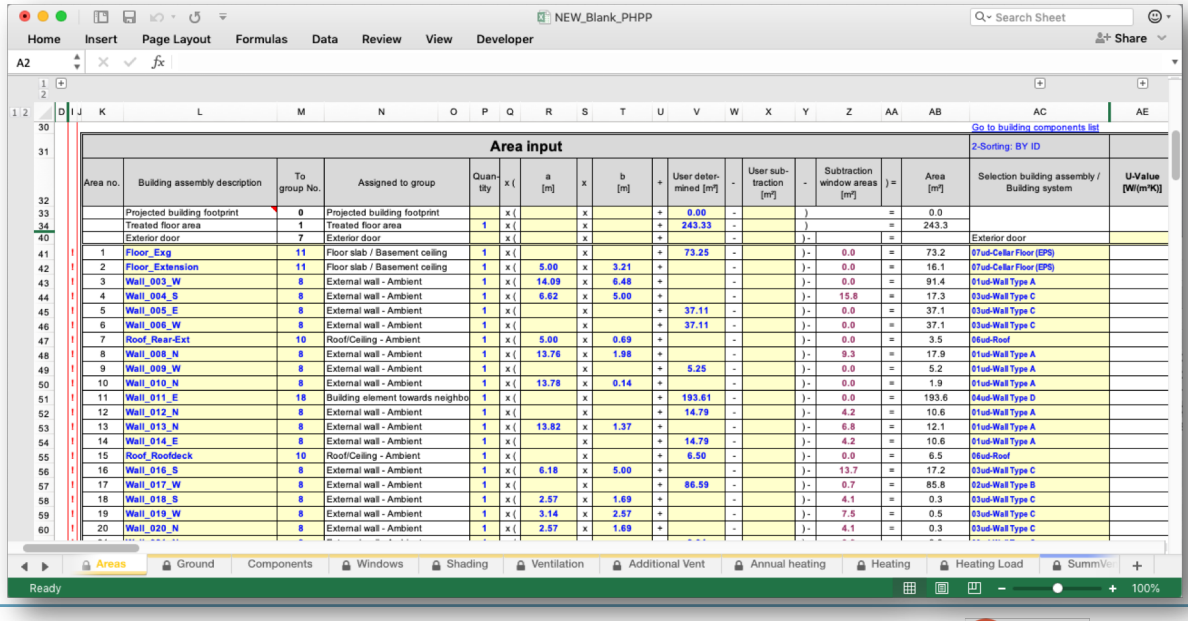
All our DesignPH Data is now in our PHPP



47 / 49

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Finish filling in the PHPP

- Custom Climates
- Some surface settings (Absorptivity, Emissivity, Shading)
- Any Ground elements / ground contact
- Any mechanical heating, cooling, dehumidification
- Summer Comfort (operable windows)
- Detailed room-by-room ventilation
- Custom ventilation units, duct insulation, duct lengths, etc...
- Anything to do with the Variants worksheet
- Anything PER related
- Anything 'Non-Res' (use, lighting, IHG)
- Electricity worksheets
- DHW, Solar, PV or Hydronic systems

48 / 49

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Thank You!

Ed@NAPHNetwork.org