

NORTH EAST CLUSTER vs. SOUTH-WEST CLUSTER

Table 1: Simulation model input data.

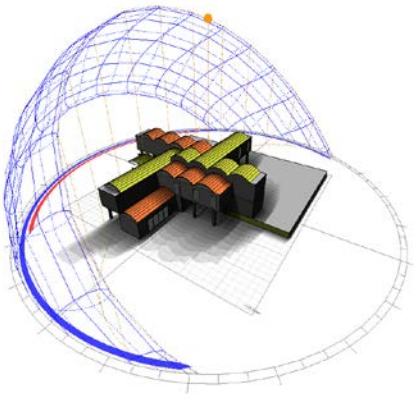
SIM model input.	Unit	NE	SW	
GEOMETRY resume				
Heated surface	m	88.6	102.33	
Conditioned volume	m	193	350	
Exposed wall surface	m ²	98.733	139.29	
Roof area	m	77	91.22	
Windows area	m	19.54	26.47	
	South	0	11.54	
	North	8.00	0	
	East	11.54	0	
	West	0	8.00	
Glass ratio	%	20	20.8	
Thermal zone settings				
Occupancy	W/m ²	1,5		Climate data: New Haven
Lighting	W/m ²	1,95		Lat: 41.31° N
Tec. equipment	W/m ²	1,8		Lng: 72.9°S
Operation time	h/d/w	16/7/52		
Heating and cooling set point temperature	°C	19-26		
Air changes per hour	m ³ /hm ²	1,2		

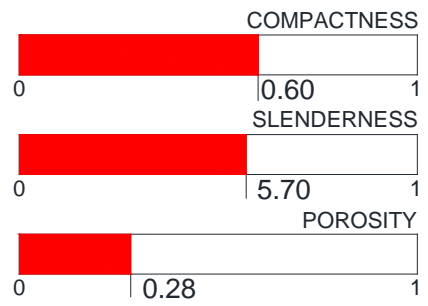
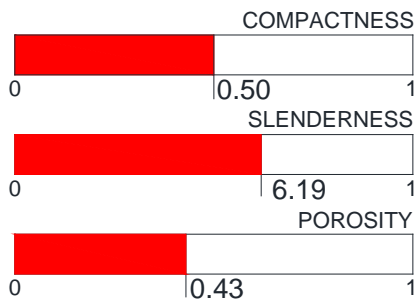
Table 2: SIM model adjustments. Variables assumed during the simulations.

		unit	value
Timber framed walls	U-value	W/m ² K	2.20
Concrete Slab (Floor)	U-Value	W/m ² K W/m ² K	0.88
Ethyl vinyl Acetate coated on tin sheets with Air-gap (Roof)	U-value	W/m ² K ach	7.1
Windows (single glazed Timber frame)	U-value	W/m ² K	5.1
Air tightness		ach	2
Thermal bridges bridges	Thermal		0.03

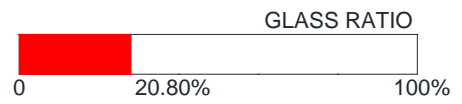
SOUTH-WEST CLUSTER

Table 1: Simulation model input data.

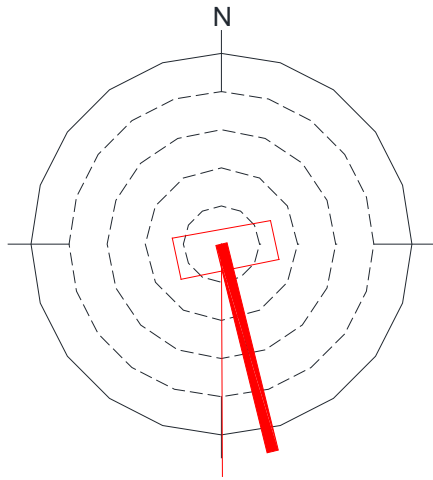
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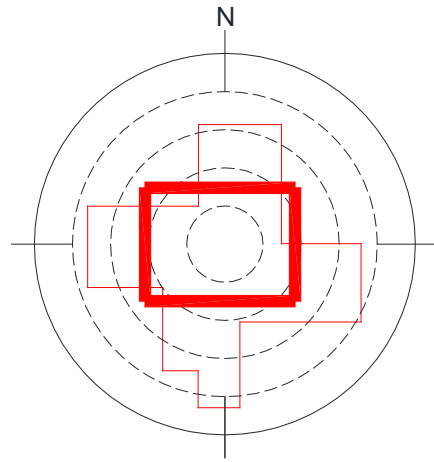
CLUSTER NE DIRECTION



CLUSTER SW DIRECTION



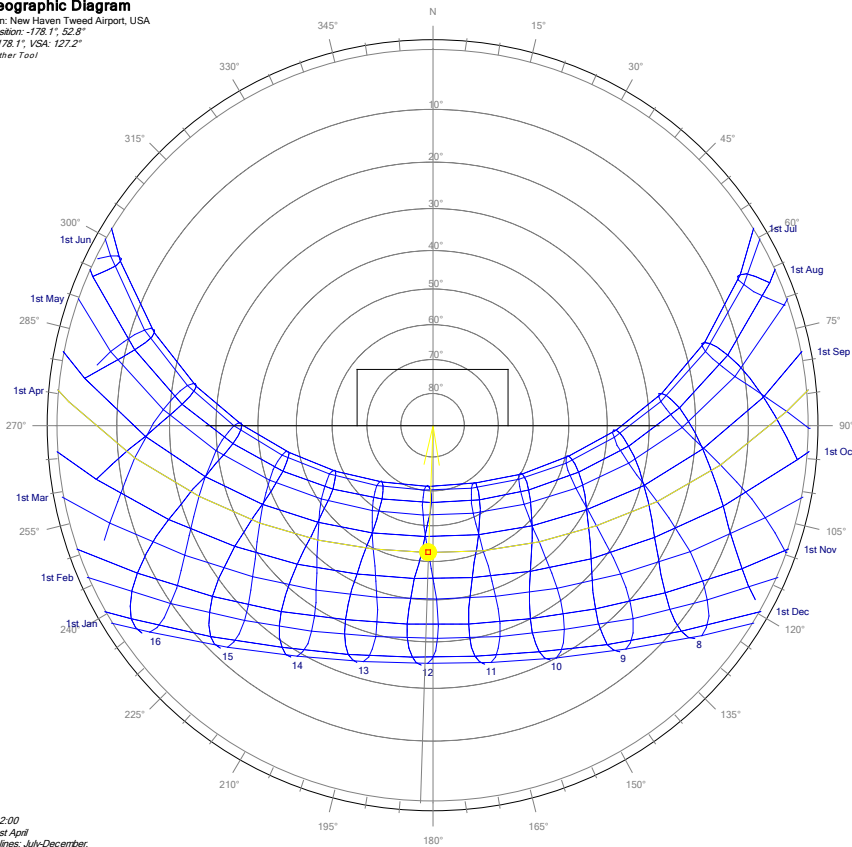
OPTIMAL ORIENTATION
 — case study



OPTIMAL FORM
 — case study

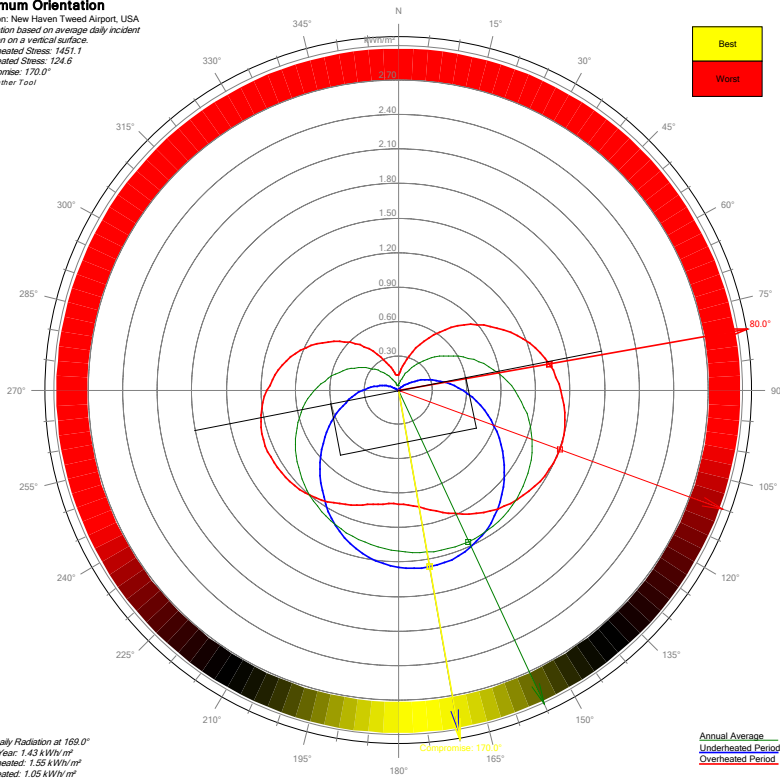
Stereographic Diagram

Location: New Haven Tweed Airport, USA
 Sun Position: -178.1° , 52.8°
 HSA: -178.1° , VSA: 127.2°
 © Weather Tool



Time: 12:00
 Date: 1st April
 Dotted lines: July-December.

Optimum Orientation
 Location: New Haven Tweed Airport, USA
 Orientation based on average daily incident radiation on a vertical surface.
 Underheated Stress: 1451.1
 Overheated Stress: 124.6
 Compromise: 170.0°
 © Weather Tool



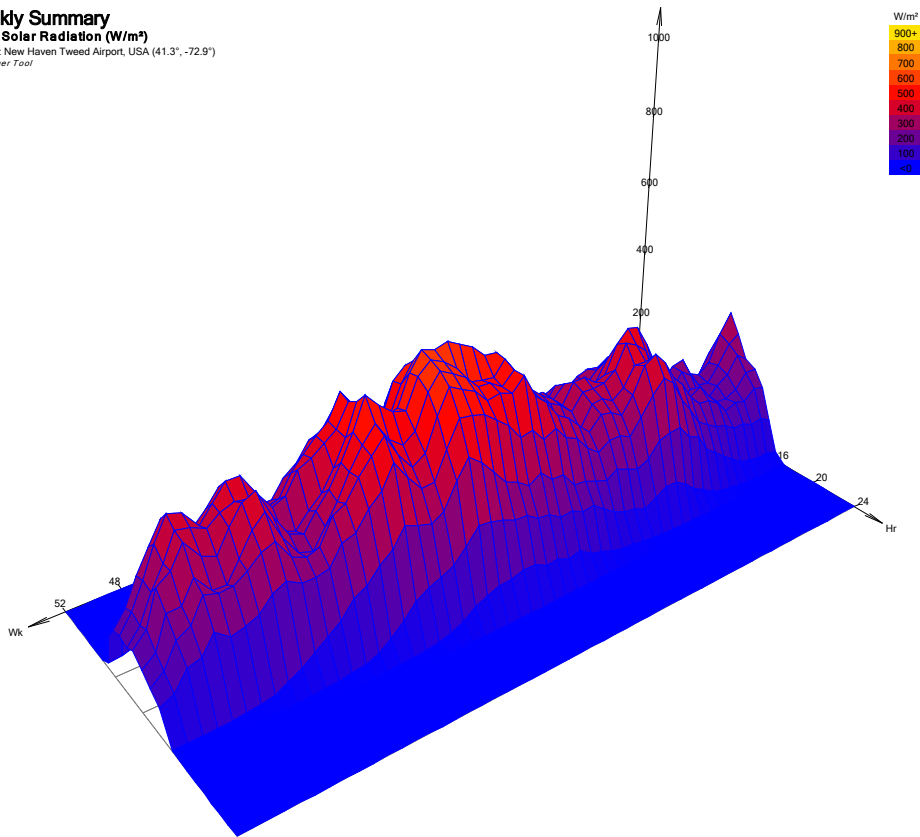
Avg. Daily Radiation at 169.0°
 Entire Year: 1.43 kWh/m²
 Underheated: 1.55 kWh/m²
 Overheated: 1.05 kWh/m²

Annual Average
 Underheated Period
 Overheated Period

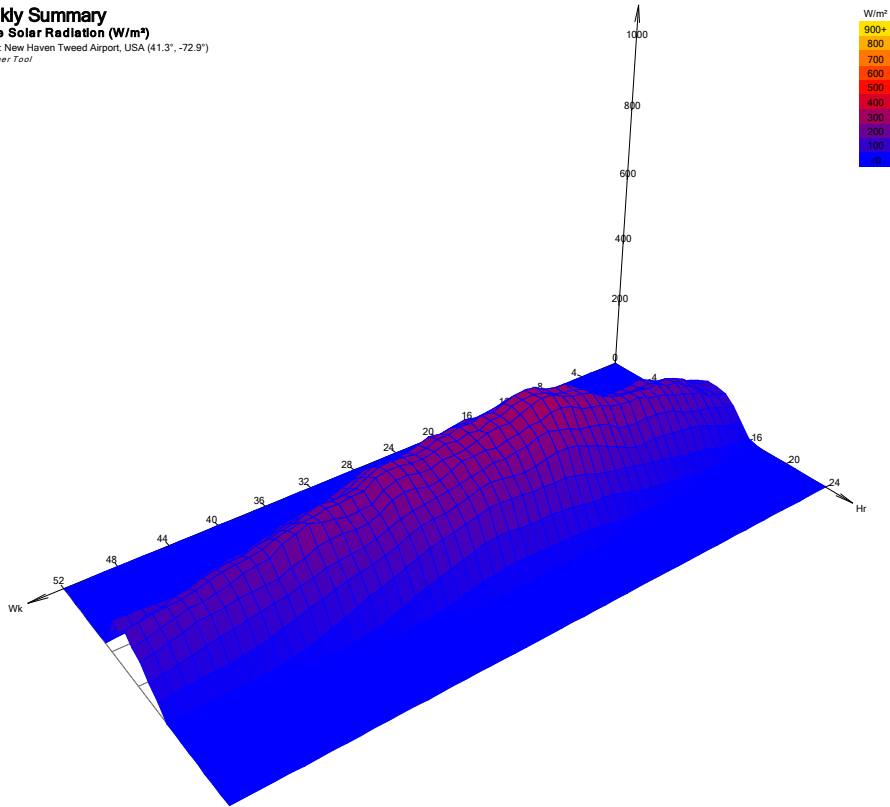
Weekly Summary

Direct Solar Radiation (W/m²)

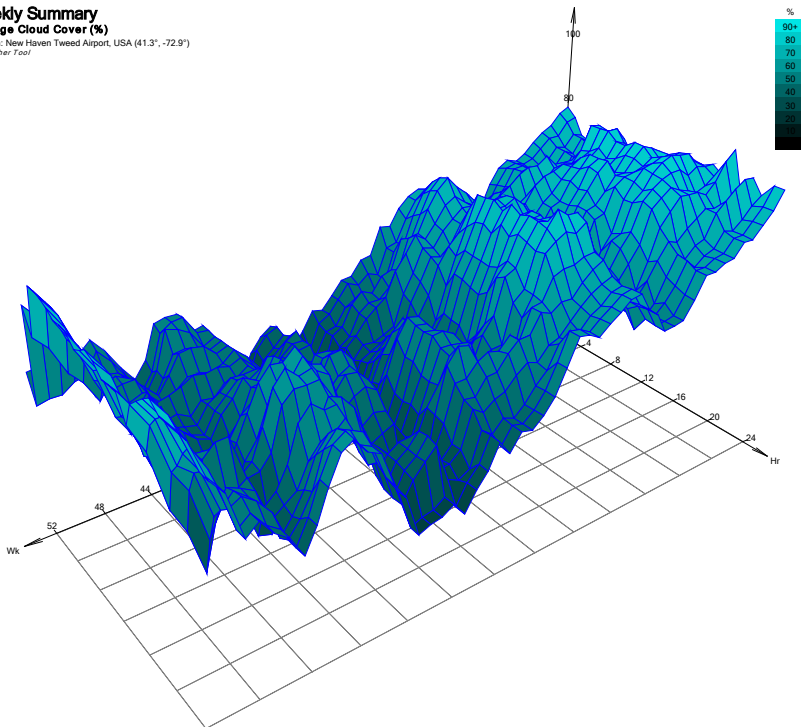
Location: New Haven Tweed Airport, USA (41.3°, -72.9°)
 © Weather Tool



Weekly Summary
Diffuse Solar Radiation (W/m²)
Location: New Haven Tweed Airport, USA (41.3°, -72.9°)
© Weather Tool



Weekly Summary
Average Cloud Cover (%)
Location: New Haven Tweed Airport, USA (41.3°, -72.9°)
© Weather Tool

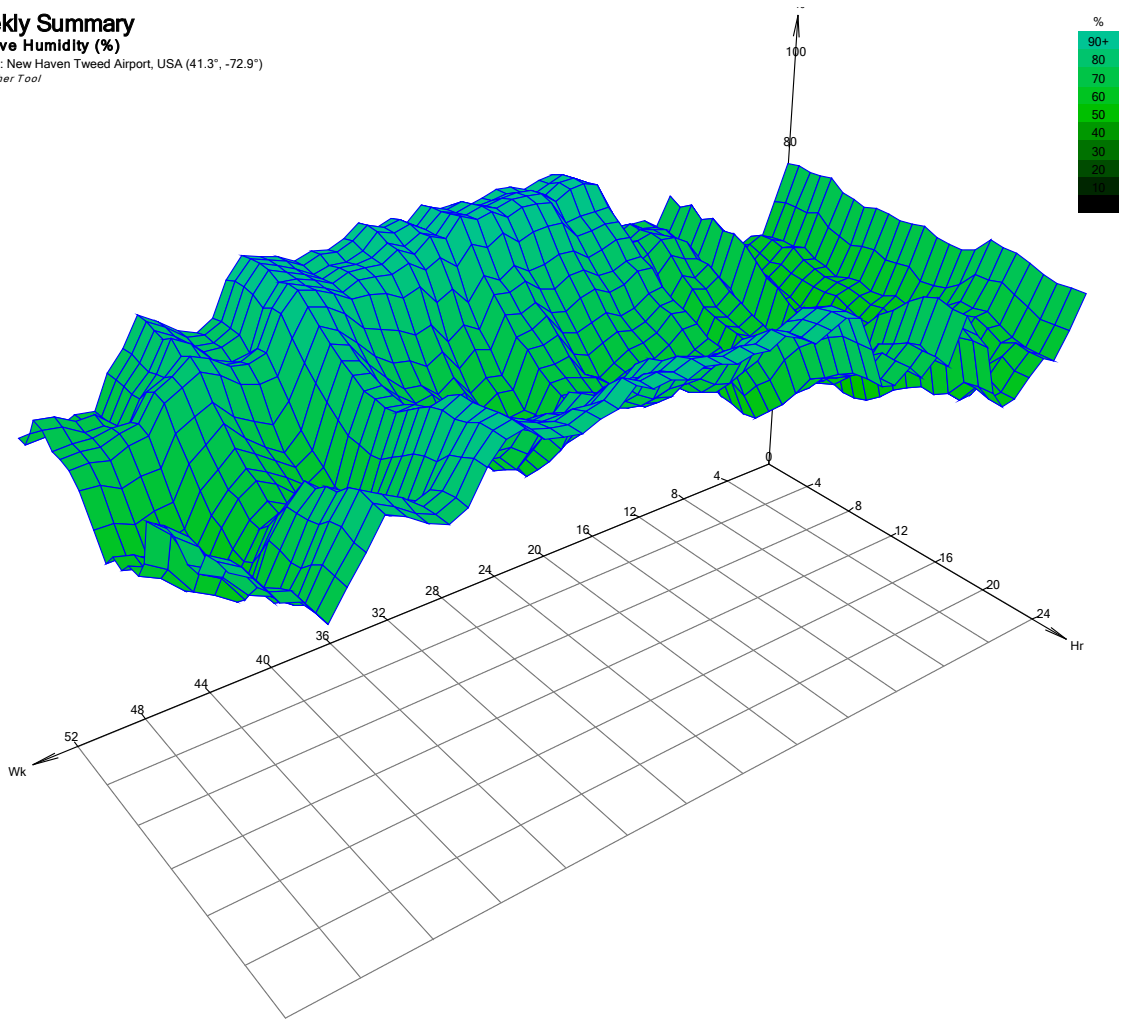


Weekly Summary

Relative Humidity (%)

Location: New Haven Tweed Airport, USA (41.3°, -72.9°)

© Weather Tool



Weekly Summary

Average Wind Speed (km/h)

Location: New Haven Tweed Airport, USA (41.3°, -72.9°)

© Weather Tool

