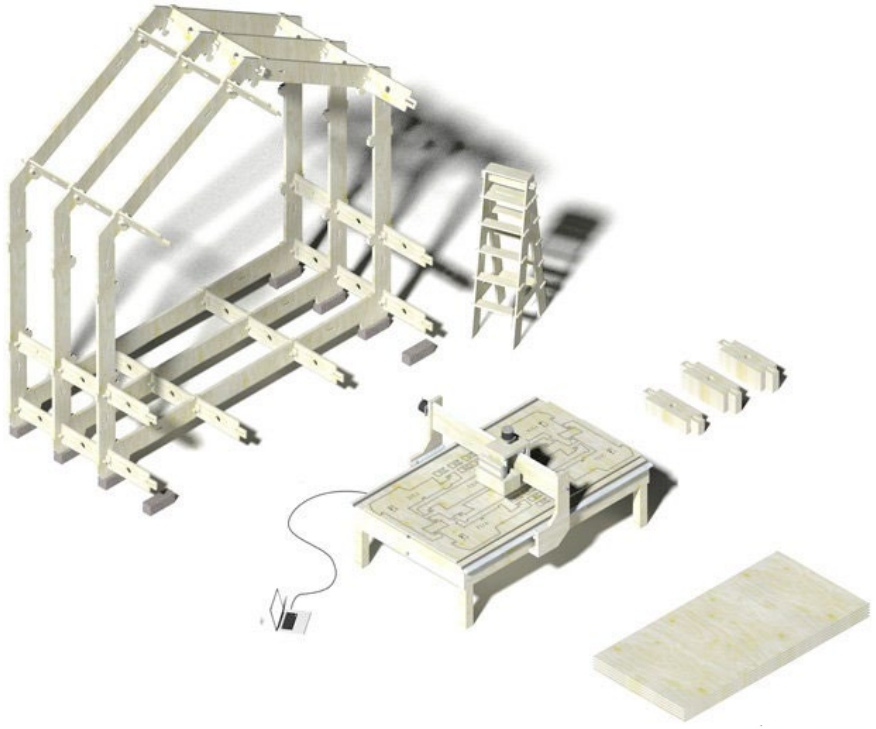
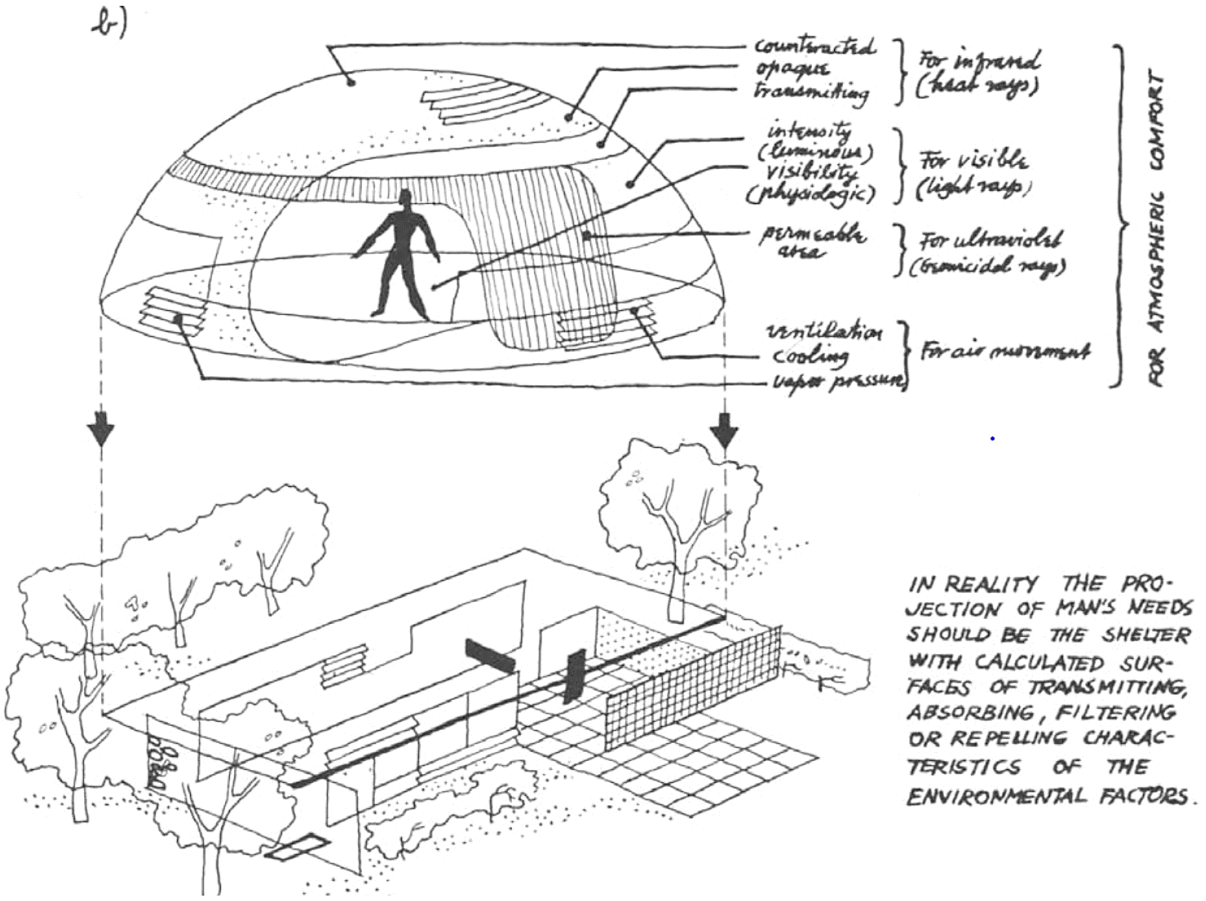
CLIMATE AND BUILT FORMS

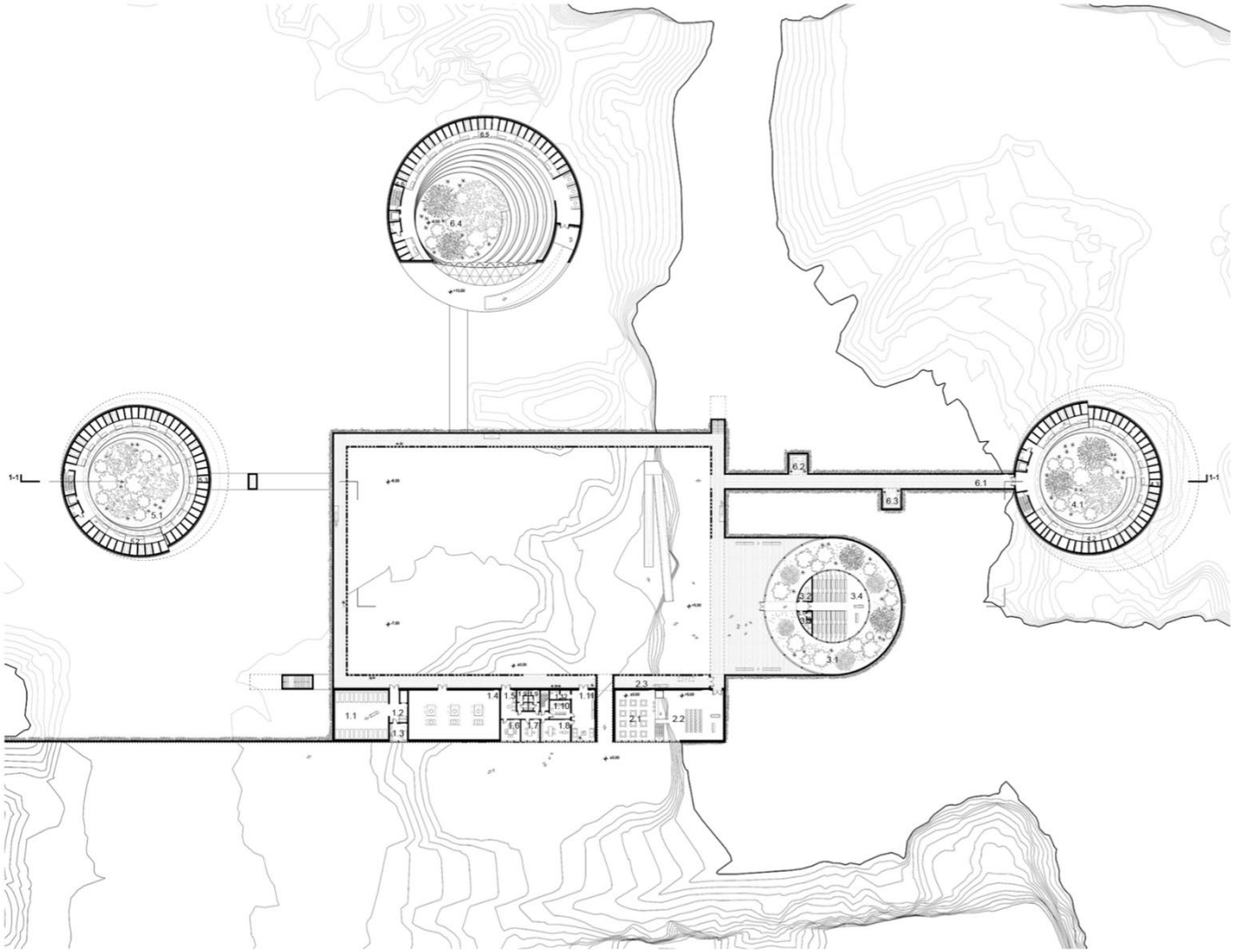
AAR4532+AAR4832 _ aug/dec 2023



FOCUS >> climate as a basis for architectural design



Victor Olgyay _ Design with Climate



Explication

Staff area
1.1 Cold storage
1.2 Hall
1.3 Warkshop
1.4 Technical room
1.5 Lobby
1.6 Staff room
1.7 Office
1.8 Office
1.9 Changing rooms
1.10 Ceremony room
1.11 Waiting hall
1.12 Restroom
1.13 Open corridor

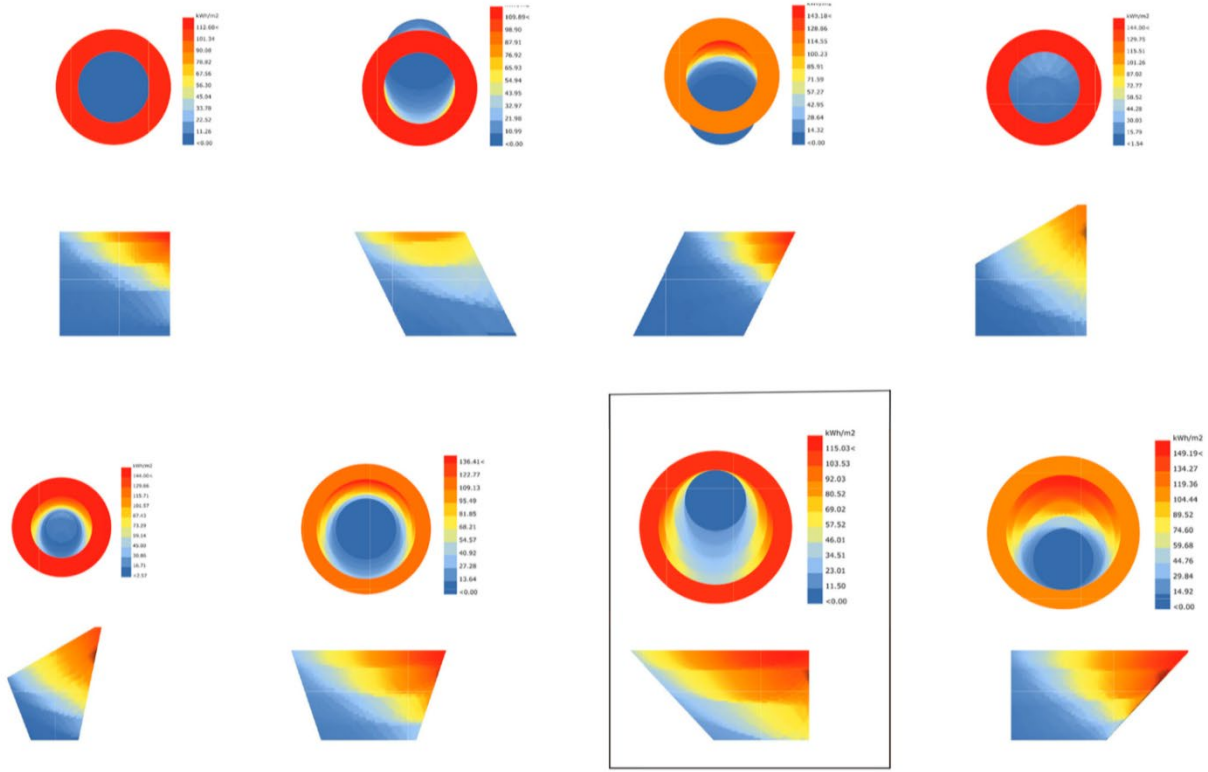
Visitor area
2.1 Meal area
2.2 Small ceremony hall
2.3 Staff corridor

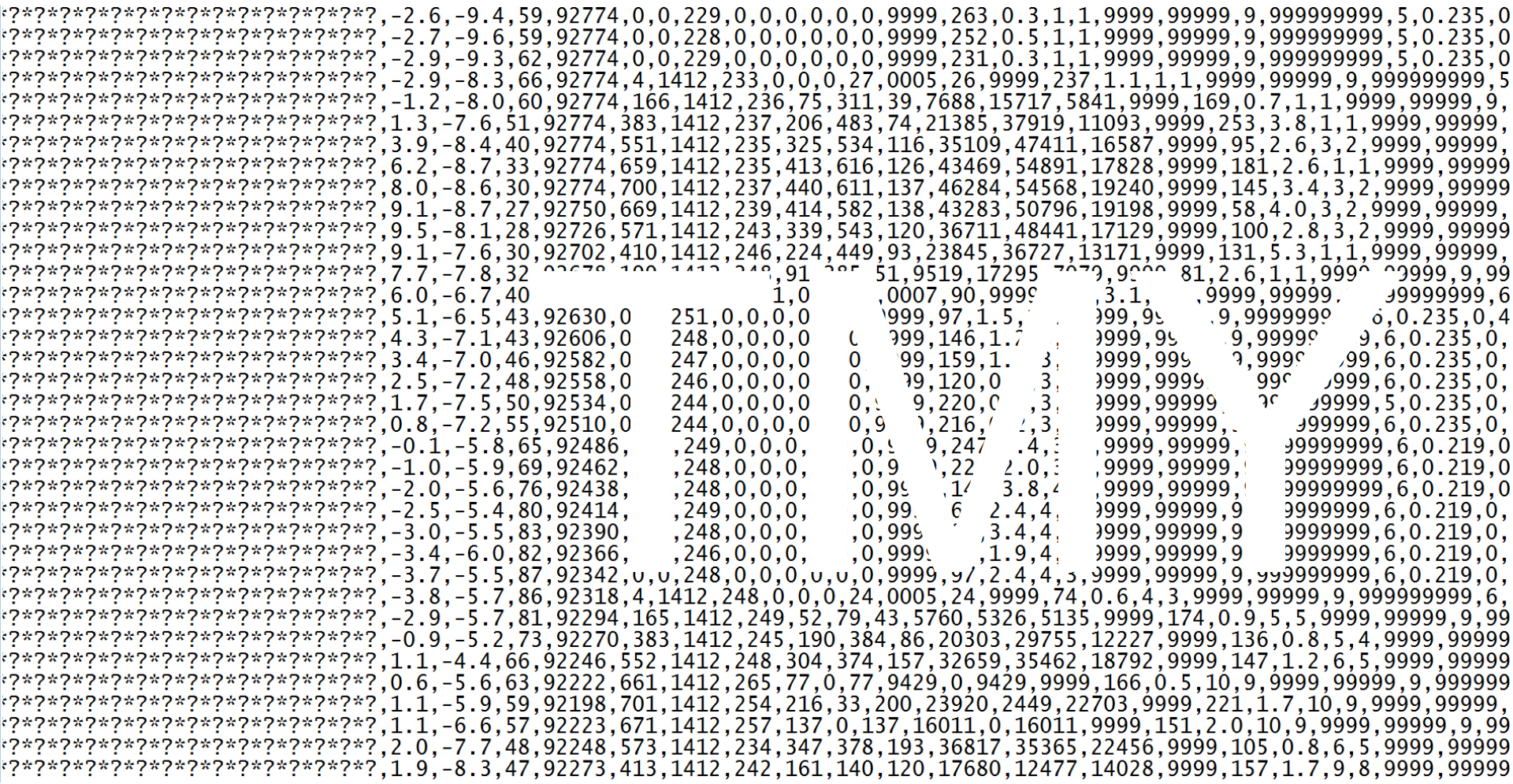
Ceremony area
3.1 Garden
3.2 Srorage
3.3 Office
3.4 Main ceremony hall

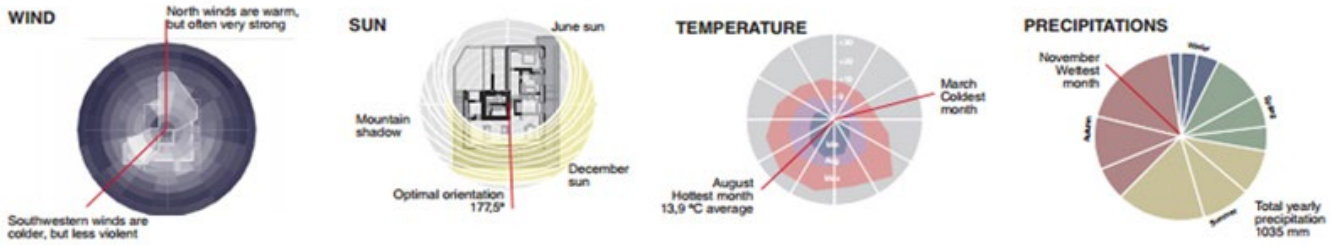
Cemetery
4.1 Garden
4.2 Private visitor room
4.3 Grave area

Cemetery
5.1 Garden
5.2 Private visitor room
5.3 Grave area

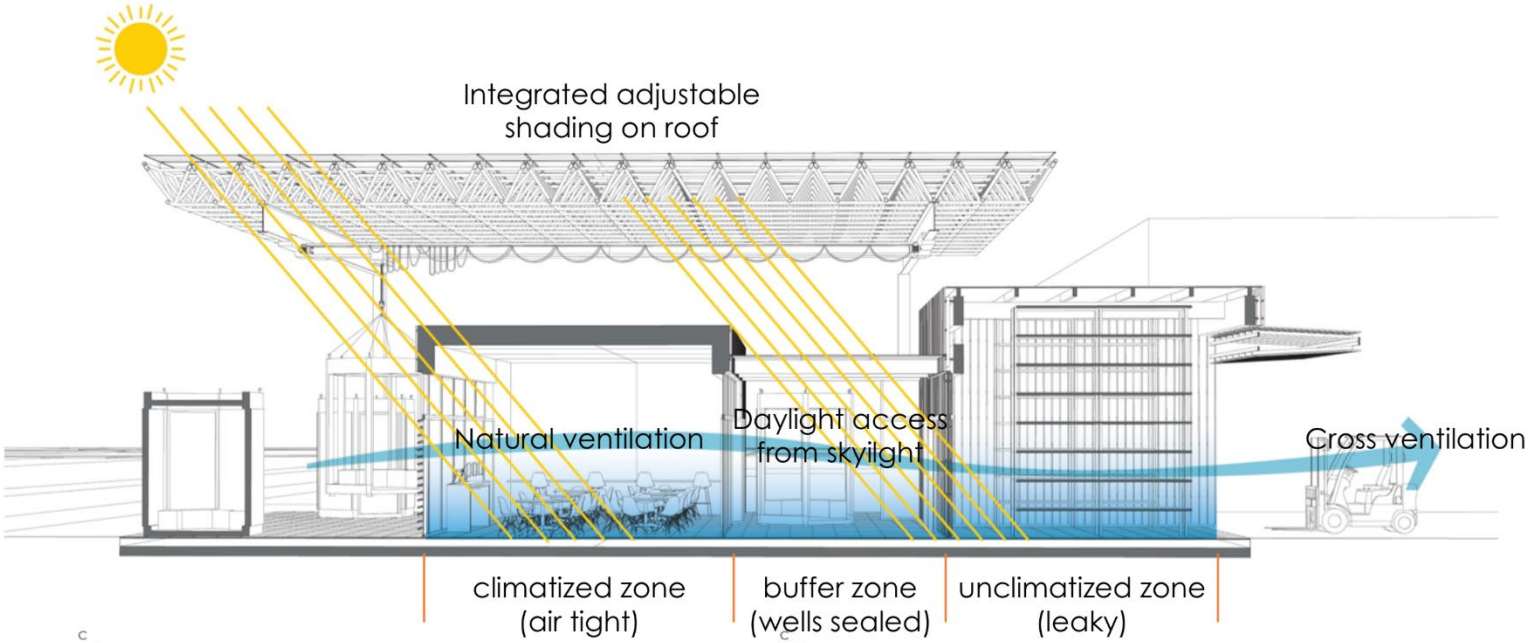
Cemetery
6.1 Corridor
6.2 Rest area
6.3 Rest area
6.4 Garden
6.5 Private visitor room
6.6 Grave area

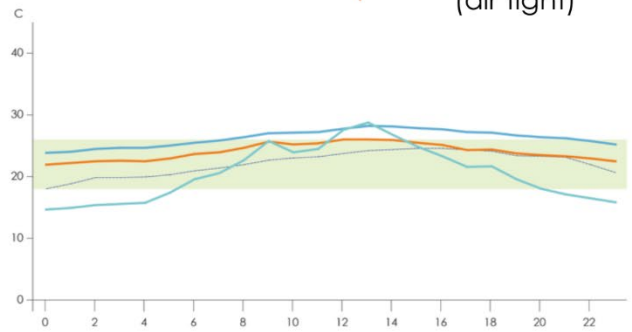

kWh/m2
115.03<
103.53
92.03
80.52
69.02
57.52
46.01
34.51
23.01
11.50
<0.00





Translating data into diagrams informing the design process


Integrated adjustable
shading on roof
Natural ventilation
Daylight access
from skyilght
Cross ventilation
climatized zone
(air tight)
buffer zone
(wells sealed)
unclimatized zone
(leaky)


C
40
30
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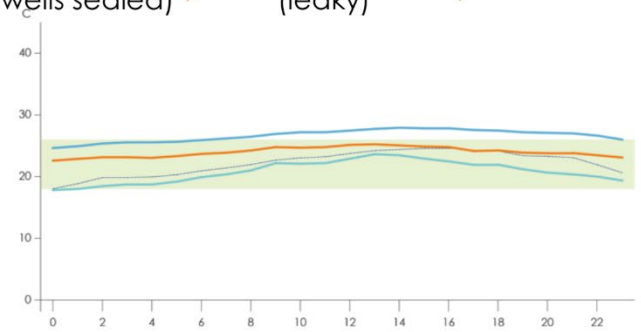
C
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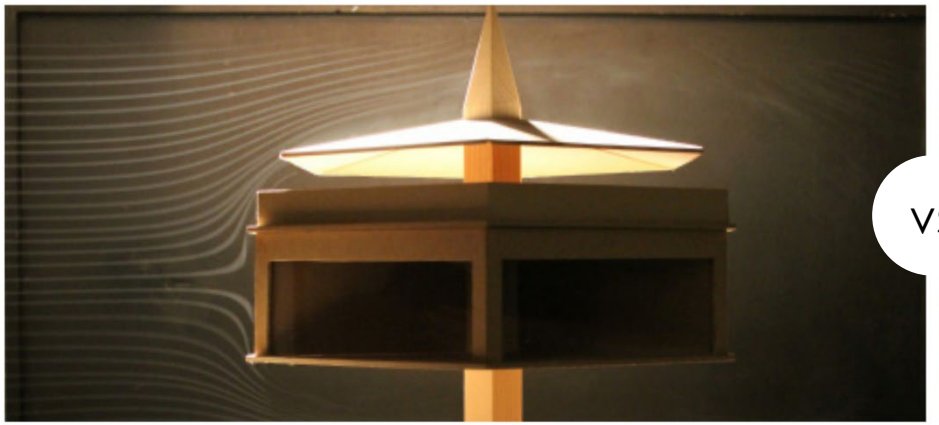
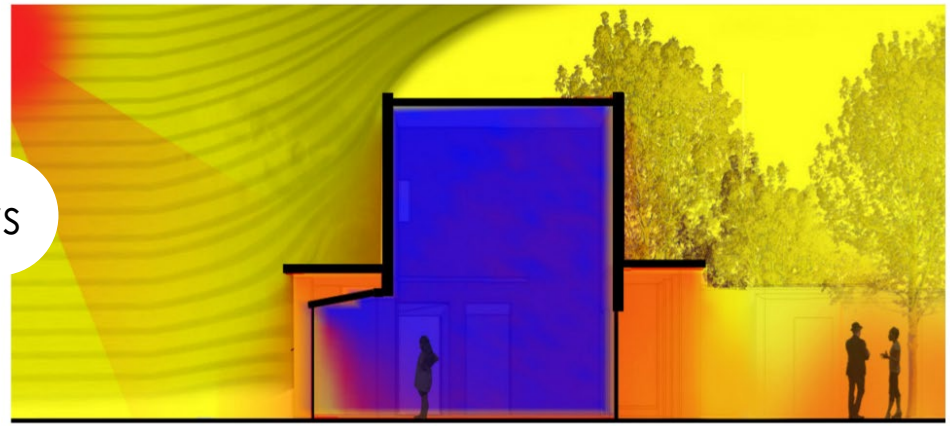
Learning outcome

Main focus of the course is the **environmental performance** of climate adaptive buildings and their ability to passively create comfortable internal conditions. Thus energy.

Tools



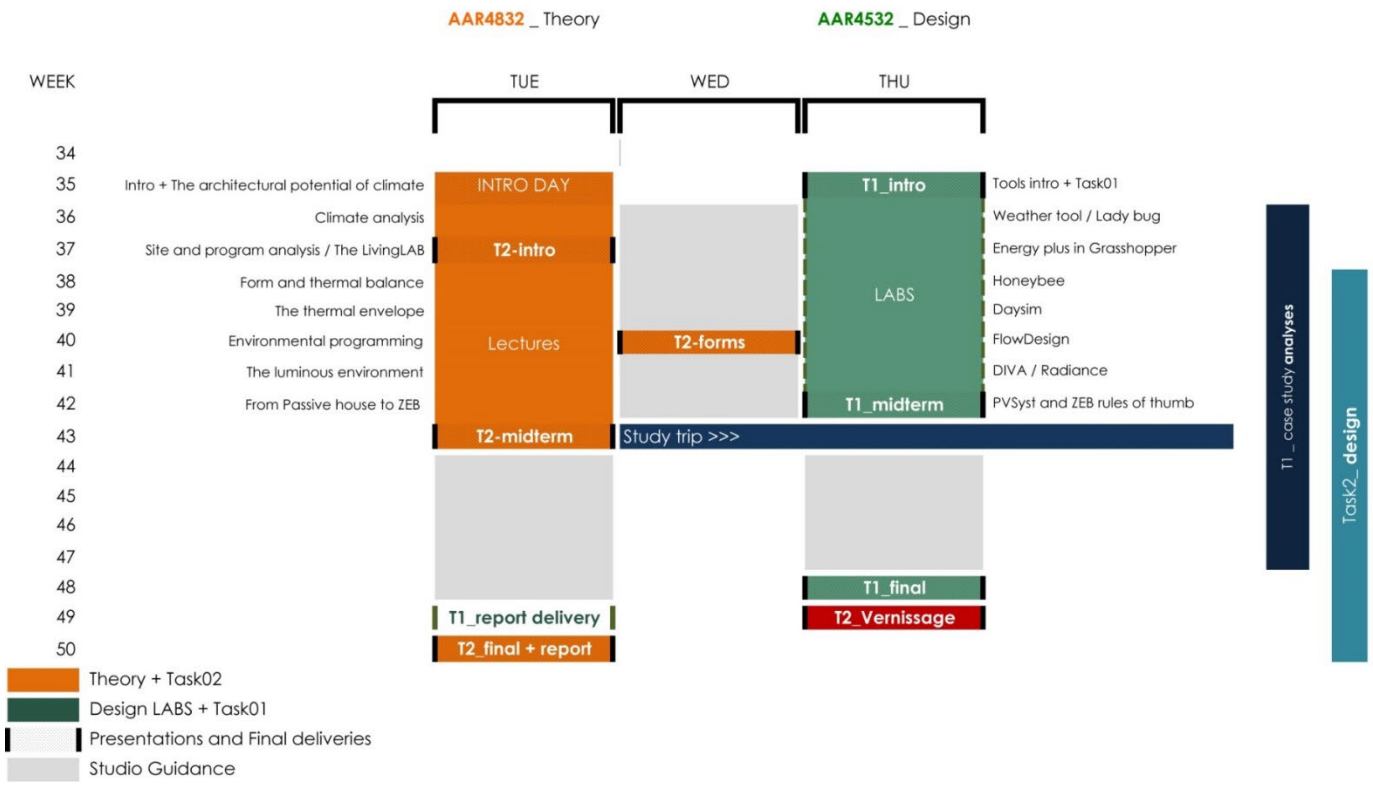
vs



analogue

digital

AAR4832+AAR4532 Detailed program



U.1 _ The architectural potential of climate
U.2 _ The bioclimatic approach
U.3 _ **FORM** and thermal balance
U.4 _ **HEAT** - Passive solar heating systems
U.6 _ **AIR** - Natural ventilation strategies
U.7 _ **LIGHT** - The luminous environment

Task 1 > Task 2

Analysis > Application

scope _ **learning principles and tools** for sustainable architecture while developing competences

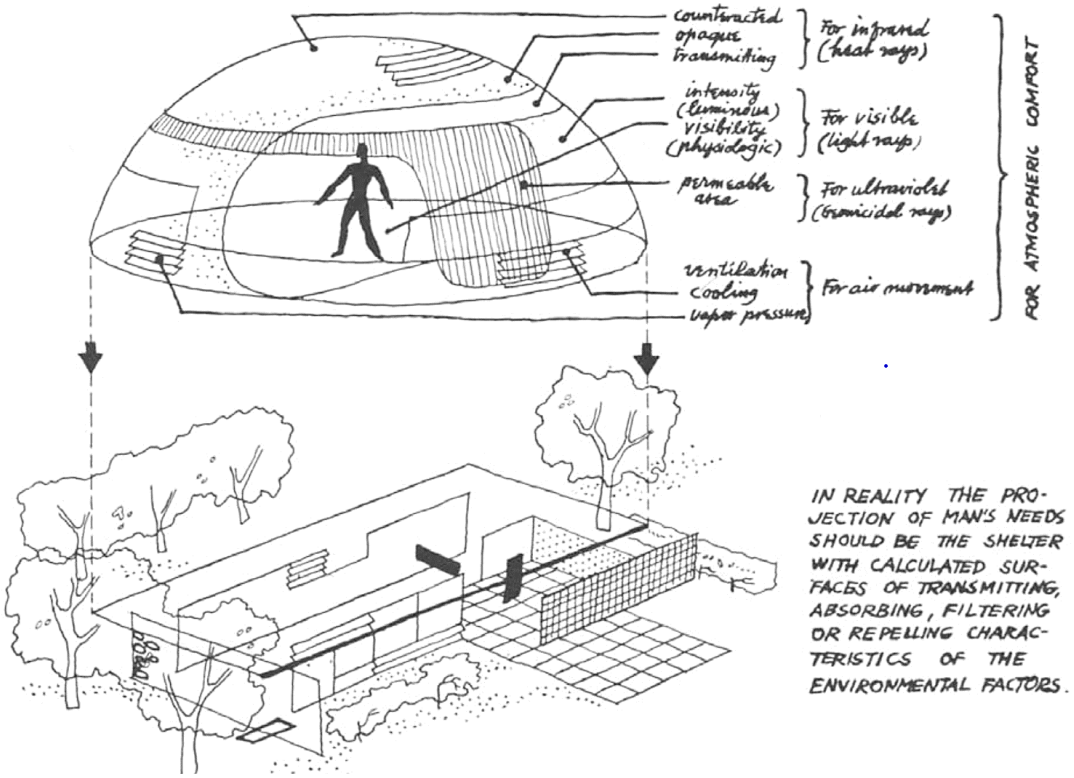
scope _ defining a meaningfull **design process** based on the understanding of the external environment

CASE STUDY ANALYSES >> ARCHITECTURAL DESIGN

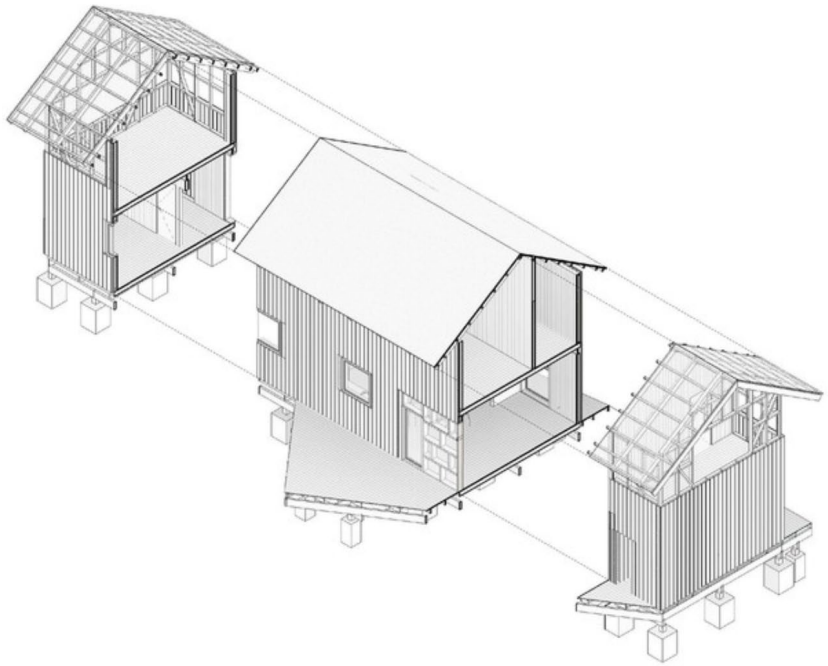
Task 2: studio >> climate adaption

TASK 2 _ The bioclimatic shelter

Experimental design of Shelters for Post-Disaster Recovery and Development



1963 _ Any building, as a bioclimatic shelter, should "be able to absorb or repel climatic factors in relation to their beneficial or adverse role for human comfort"
Victor Olgyay



Program

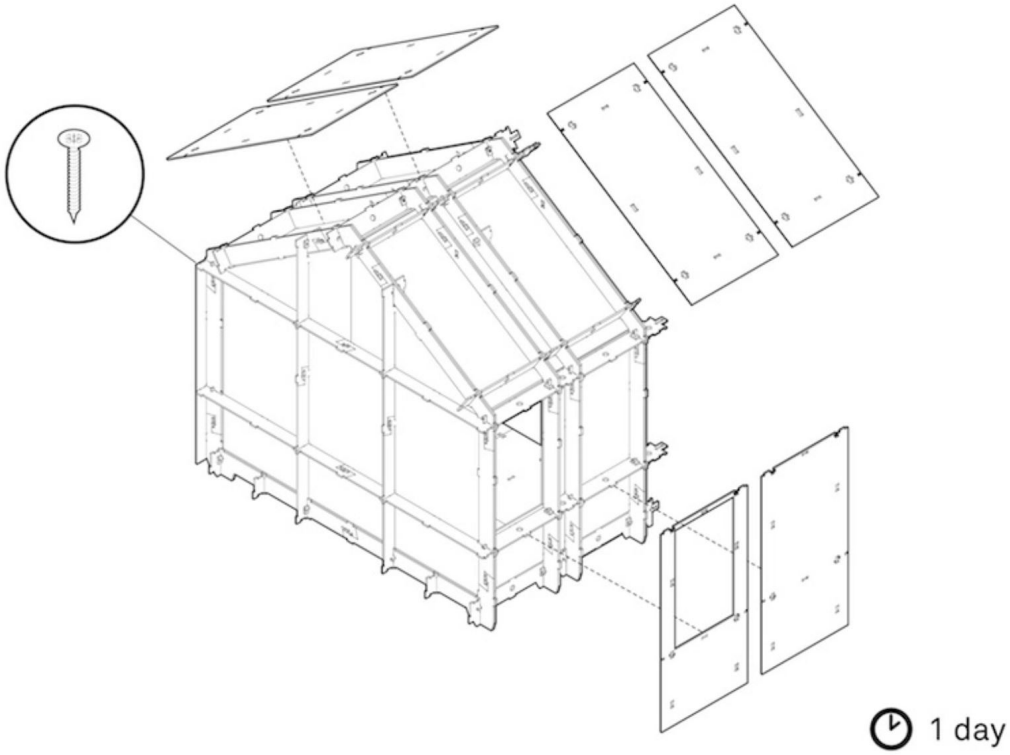
- Prefabricated
- Fast-built
- Climate adapted shelters

For post-disaster recovery and development

Source: https://www.archdaily.com/965657/architecture-with-sip-panels-fast-build-high-performance-prefabricated-homes

TASK 2 _ challenges

- Detailing for production (open source construction drawing)
- Quantitative + qualitative dimension of environmental design
- Design in four climatic contexts



Source: Wikihouse's Alastair Parvin on how to build your own house

TASK 2 _ Learning outcomes

environmental performance + environmental imagination

Understanding of climate as a source for making architecture on a quantitative and qualitative basis

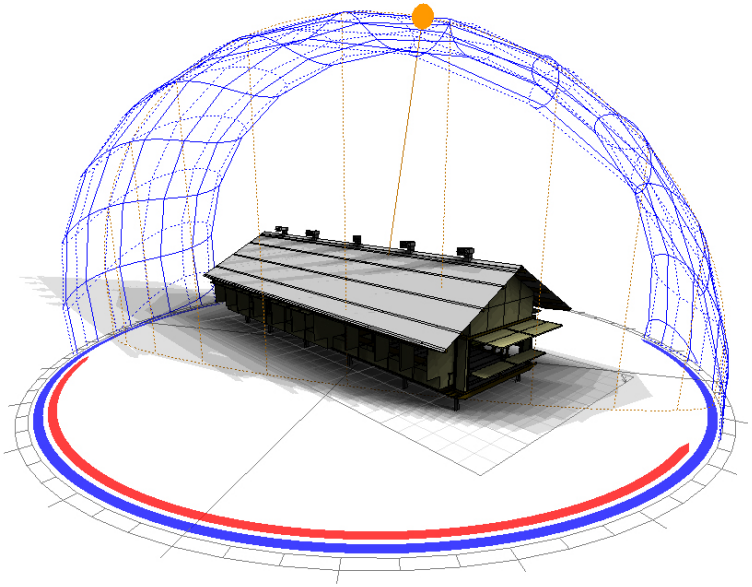
Ability to implement correct climate adaptive measures for ensuring indoor comfort while increasing buildings´ energy efficiency

Task 1 ANALYSES Know-how > application DESIGN **Task 2**

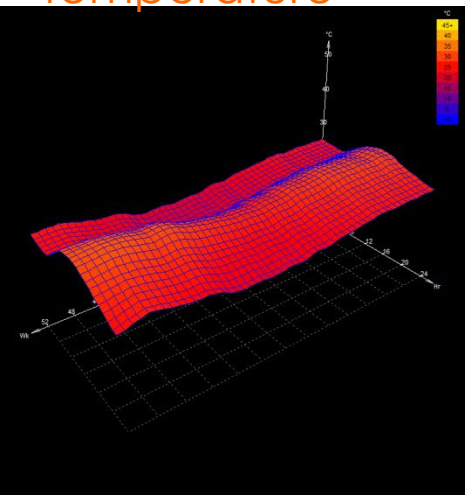
Task 1 | extracting principles and strategies for bioclimatic design from the analysis of relevant case studies

Task 1 | modeling

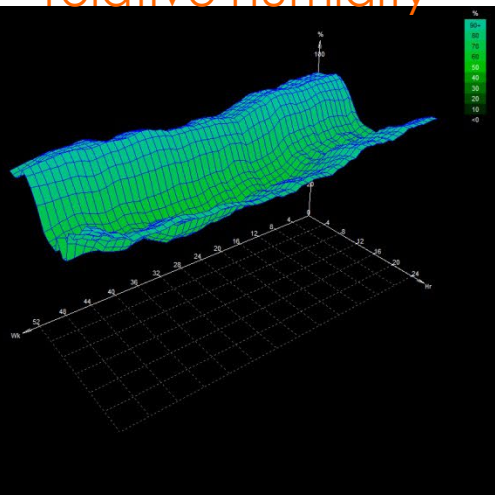
Task 1 | climate analysis and adaptation



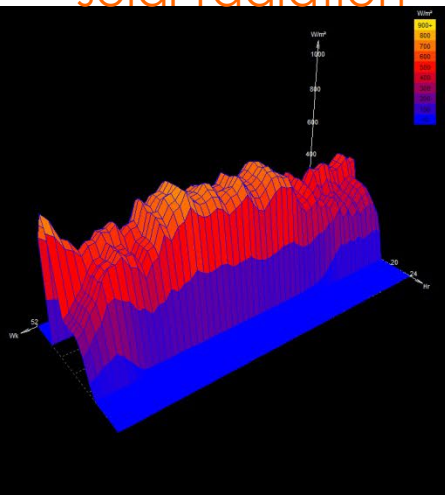
temperature



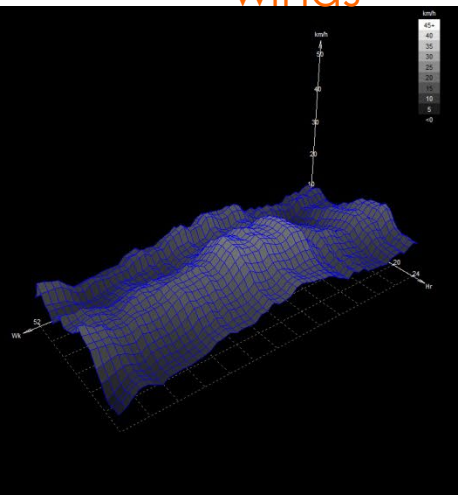
relative humidity



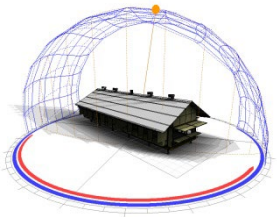
solar radiation

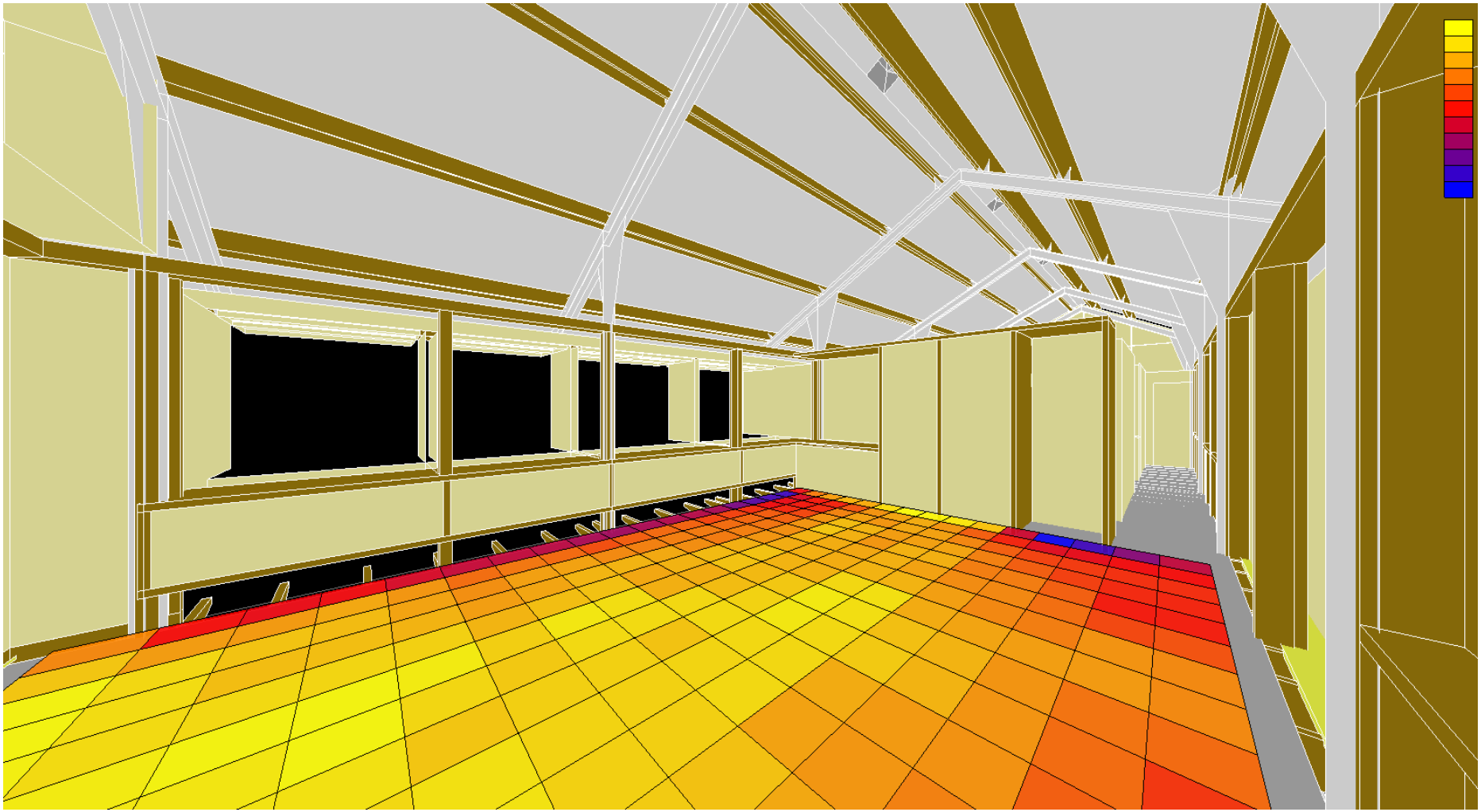


winds

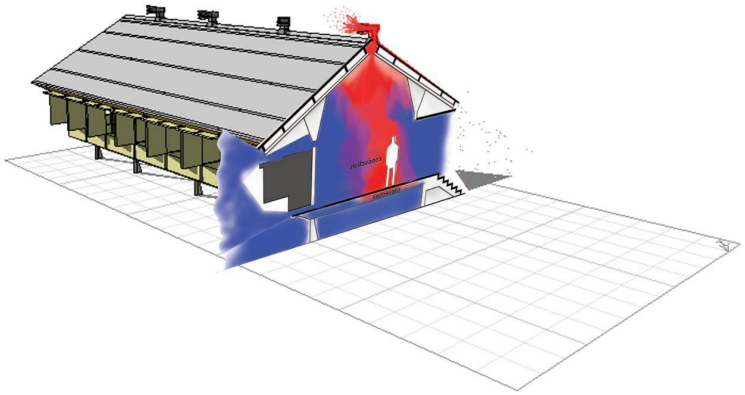


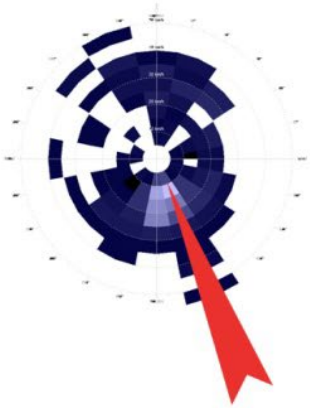
Task 1 | Internal daylight analyses

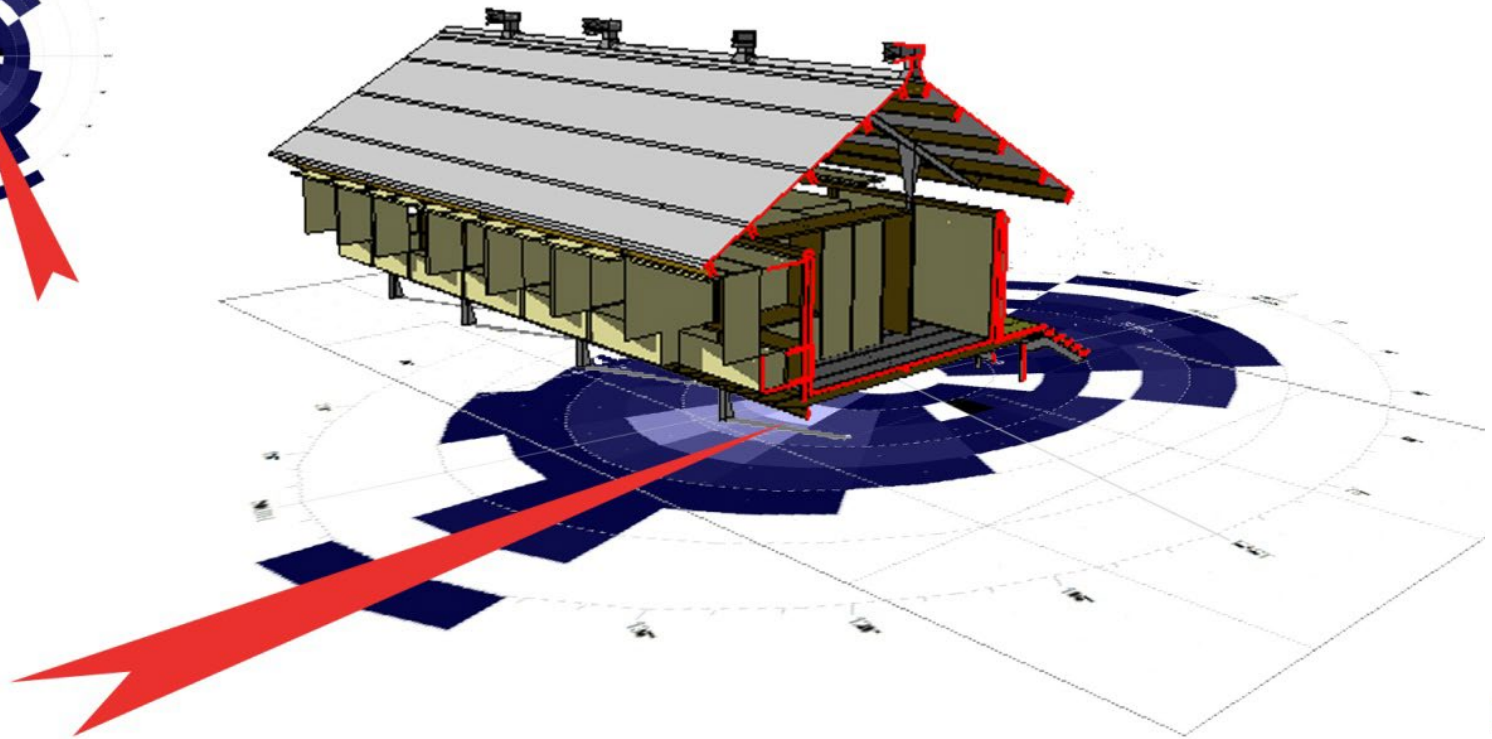




Task 1 | wind analysis







AAR4832+AAR4532 | Course logistics

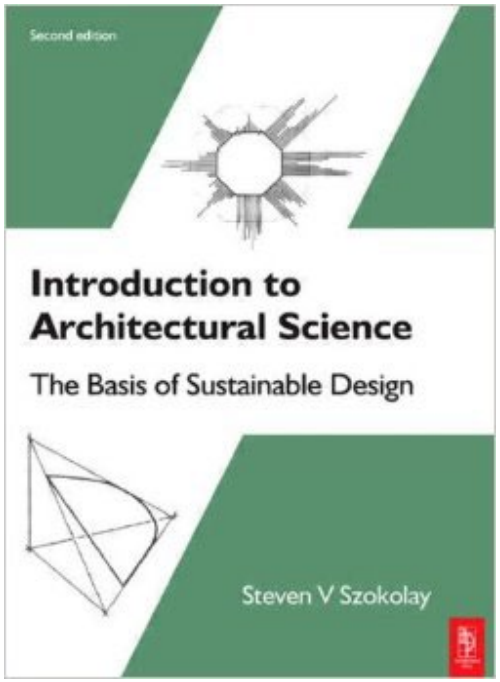
Max number of students _ 20 MSc SustArch + **8** Architecture students

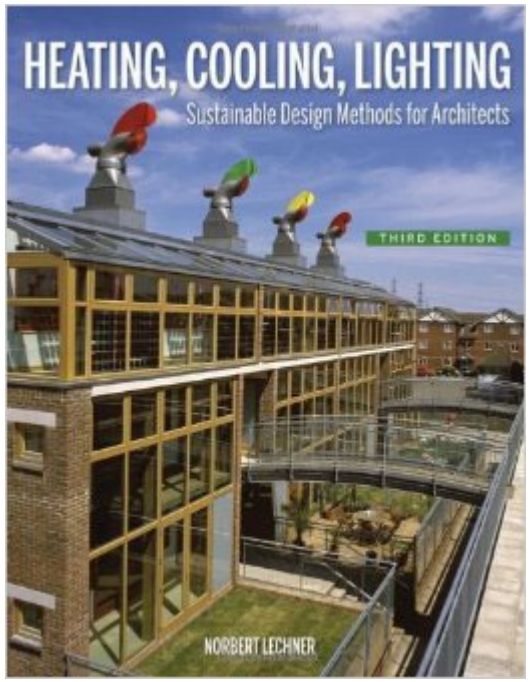
Teaching team:
Luca Finocchiaro
Anshuman Mishra
Ole Jørgen Bryn
Bunji Izumi
+ 2 Student assistants

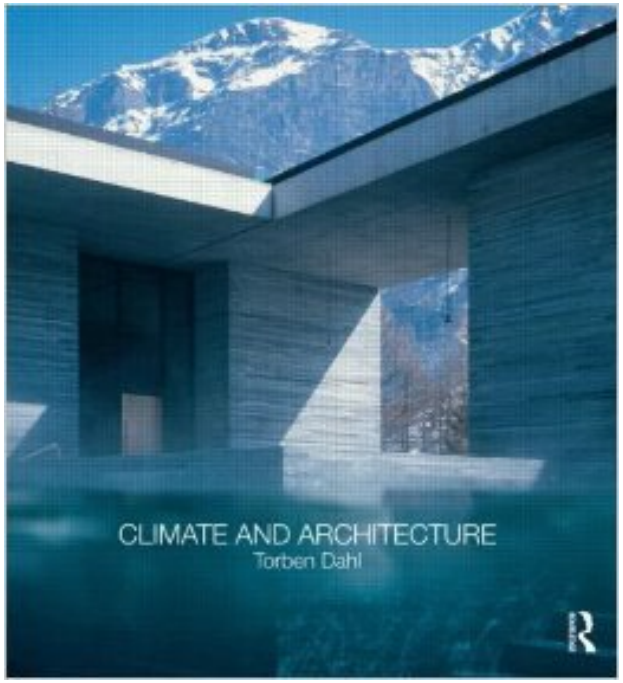
Language: English

Course Start: 28. August

AAR4832+AAR4532 | Pensum







- Steven Szokolay, The basis of sustainable design, Architectural press, USA 2008
- Norbert Lechner, Heating Cooling and Lighting, John Wiley and Sons Inc. , USA 2008
- Torben Dahl, Climate and Architecture, Routledge ED.

- Victor Olgyay, Design with Climate, Princeton University Press, New Jersey 1963

+ articles and material on itslearning