CLIMATE- RESPONSIVE POSITIVISTIC ‘RESEARCH THROUGH DESIGNING’

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Summary

1. Research through designing overview and paradigms
2. Examples of “research through designing ”climate- responsive design
3. Conclusions

Designing as research

"the development of knowledge by designing, studying the effects of this design, changing the design itself or its context, and studying the effects of the transformations. The 'TOTE model' from systems analysis may be recognized in this: Test→ Operate→ Test→ Exit." (Taeke de Jong and Theo van der Voordt 2002, p. 455

Why do we need it in landscape architectural research?

"Design as research provides a different profile of quality measures than conventional strategies." (Deming and Swaffield 2012, p. 246).

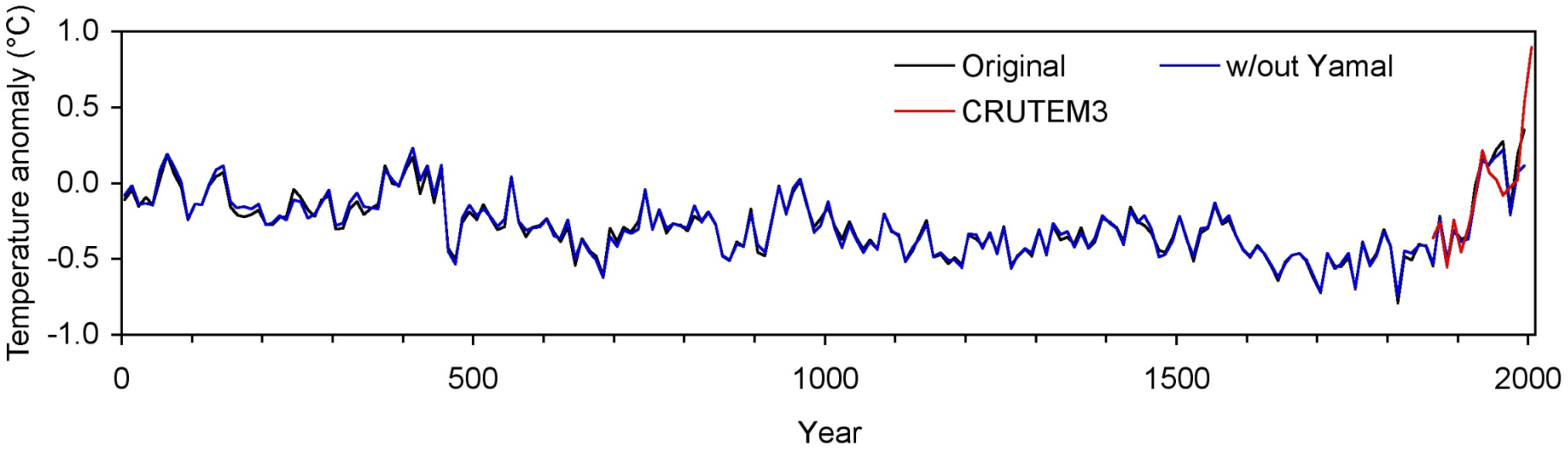
"Research-by-design is about study through design using knowledge acquired by design research" (Nijhuis &Bobbink 2012).

Research through designing (RTD) in Landscape Architecture

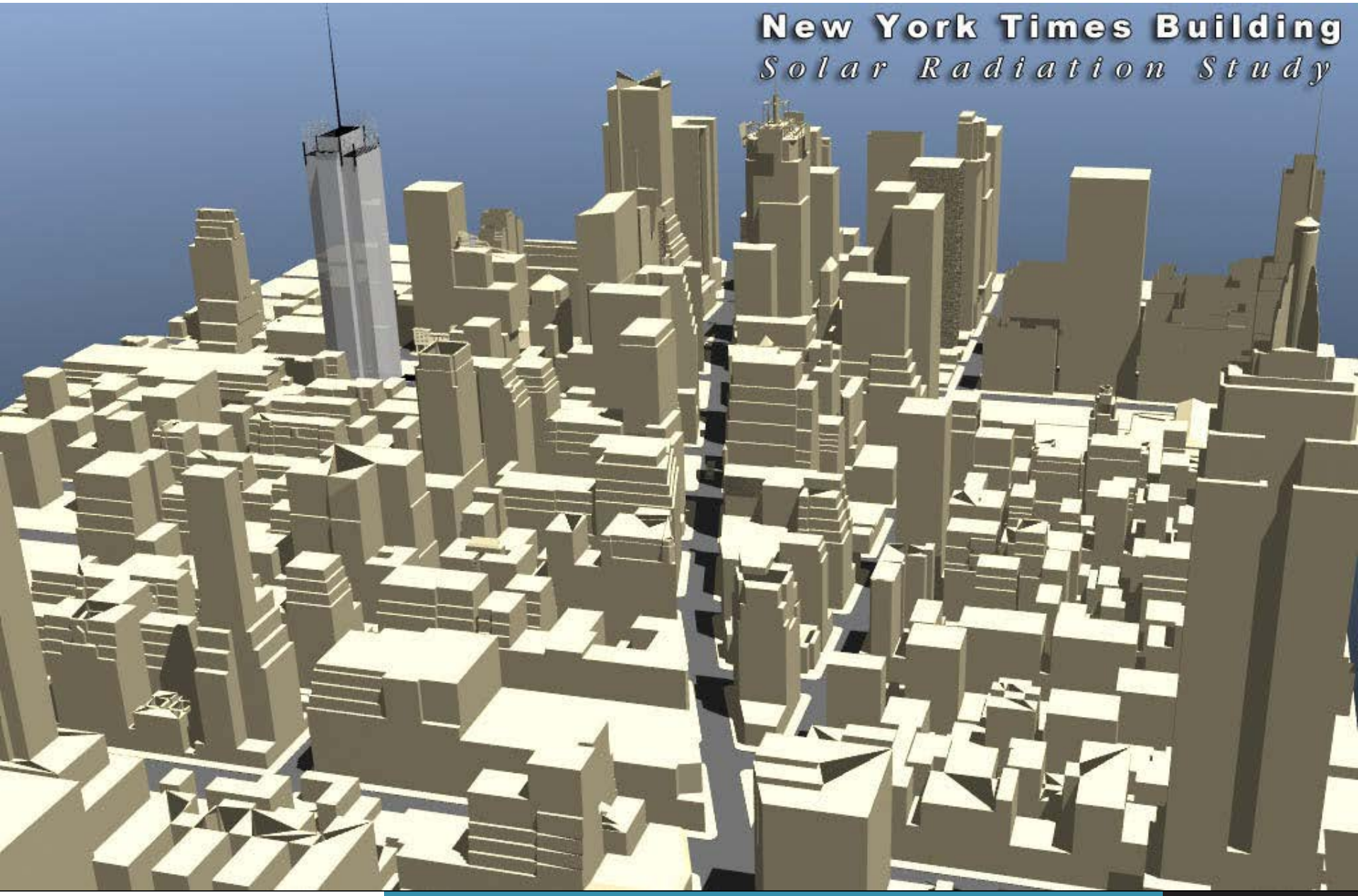
	Postpositivism	Constructivism	Advocacy	Pragmatism
fields of 'research through designing' questions	- physical/ functional - psychological	- cultural/ aesthetic - social	- social - political	- various
Kind of new design knowledge	- 'objective' - deductive/ generalizable - quantitative	- 'individual', meaning - contextual - qualitative - often: artifacts/ projects	- shaped by participants - contextual - agendas for action - qualitative and quantitative	- real-world, practice –oriented knowledge including several types of design knowledge
Research Methods	- design hypothesis testing - 'before and after design' experiments tested with surveys or measurements	- 'creative' reflection- in action - personal involvement - open- ended design process	- qualitative, - collaborative, participatory, - recursive design and participant feedback loops	- mixed methods: depending on research question/s
Research evaluation	- quantitative/ numerical - statistical analysis	- qualitative - inductive - personal interpretation	- monitoring effects on site improvement - monitoring effects on use/ perception improvement	- depends on research question and method chosen

Source: Lenzholzer, S. ; Duchhart, I. ; Koh, J. 2013 *Landscape and Urban Planning 113 (2013).* 'Research through designing' in landscape architecture

Issue that needs RTD: response to climate change



Example 1: rooftop plaza New York



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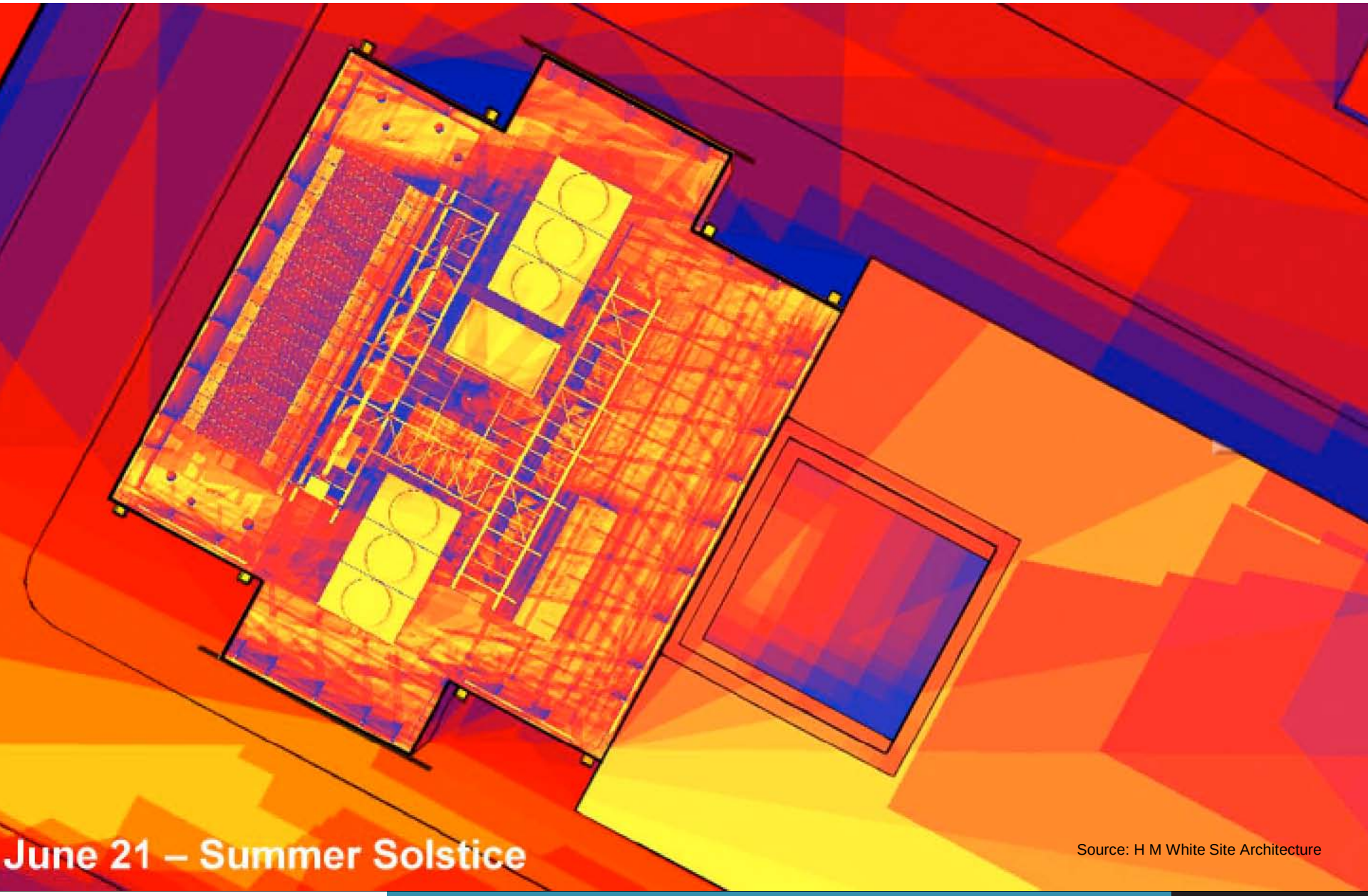

Source: H M White Site Architecture

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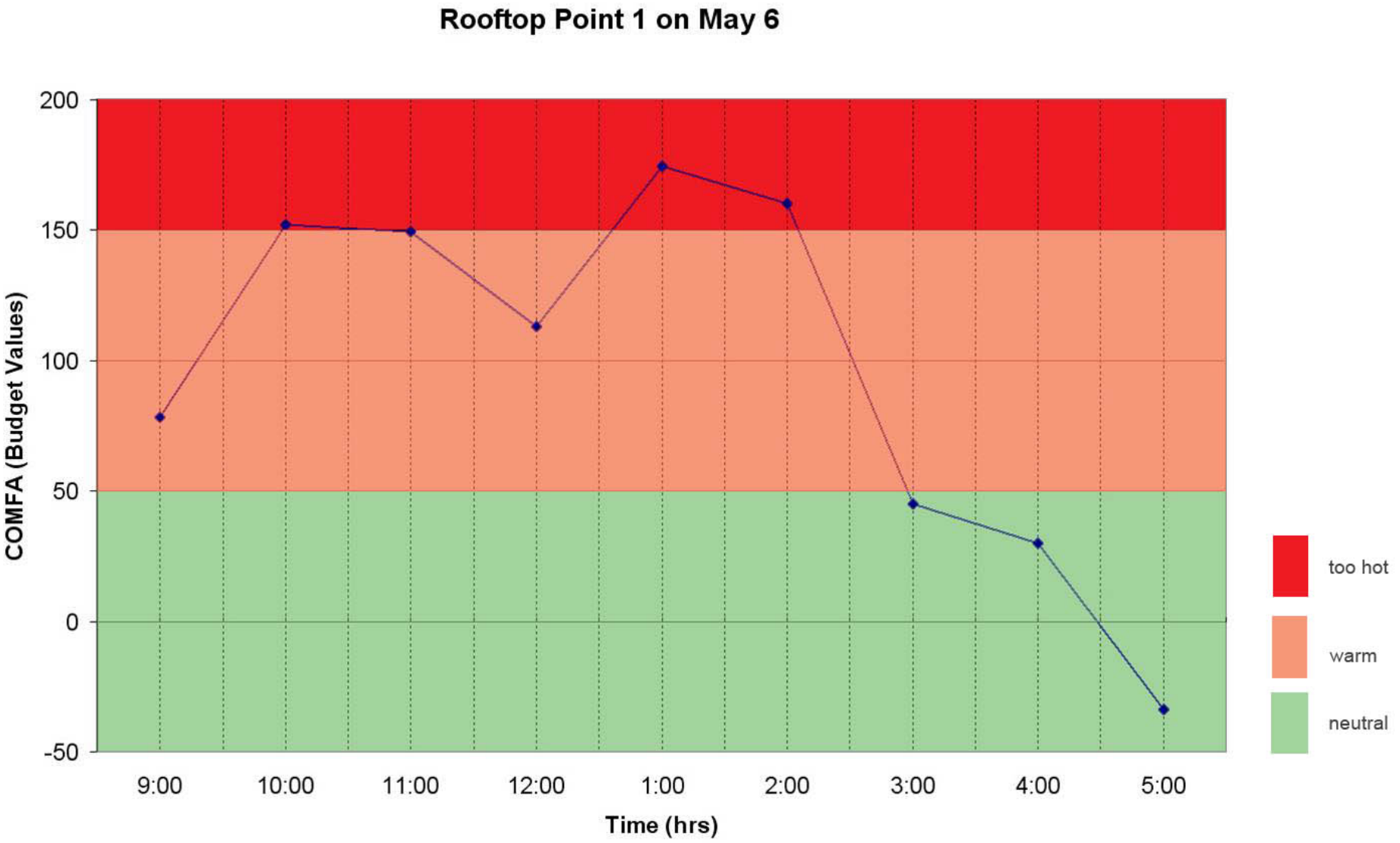

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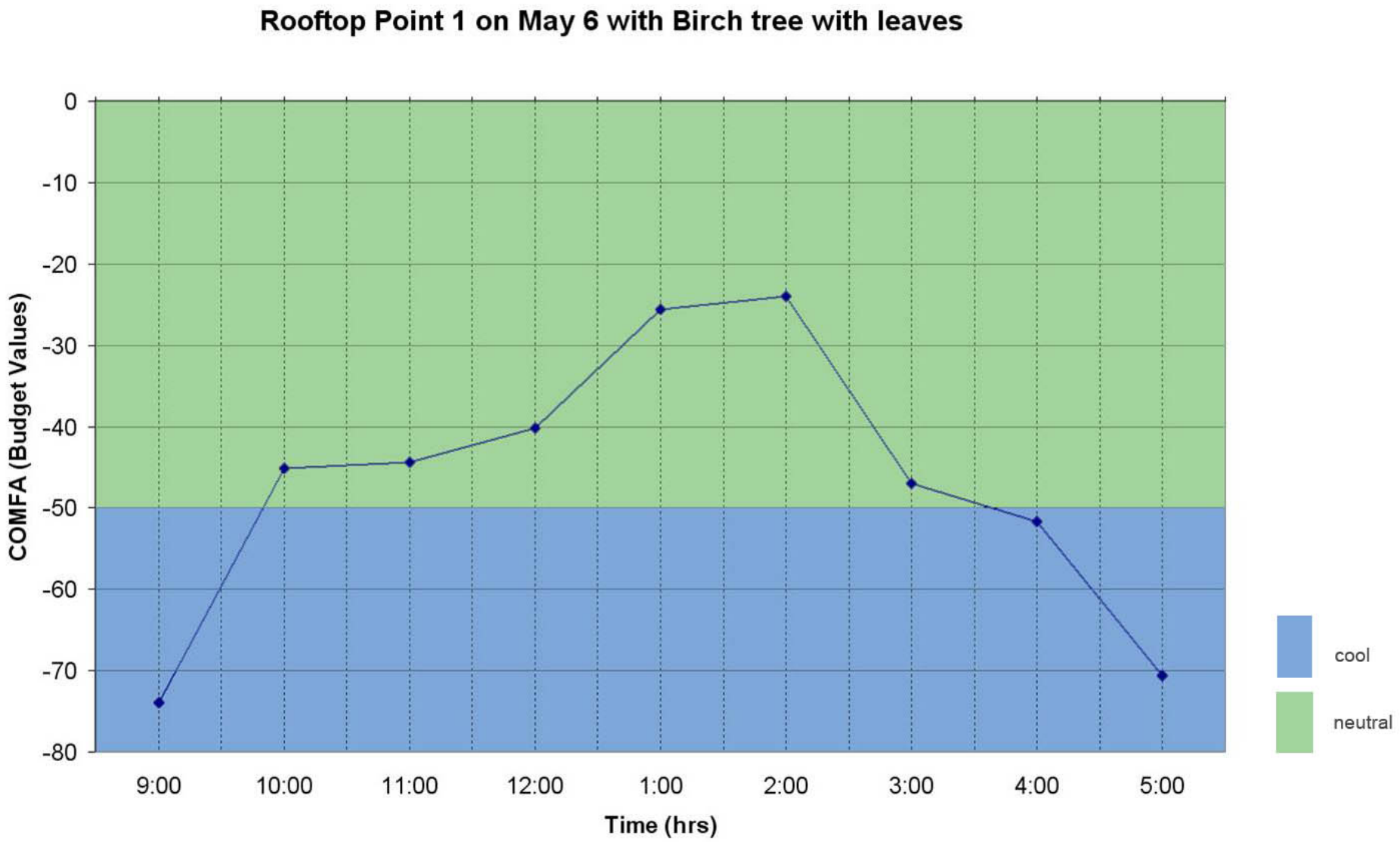

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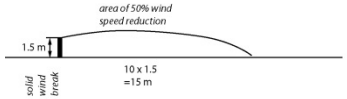
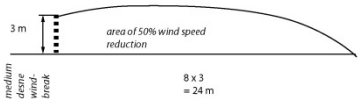
Example 2: Thermally comfortable Dutch squares

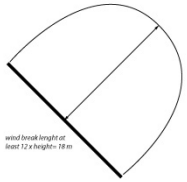
- wind protection patterns



lit. A.F.G. Jacobs
Flow around a line obstacle



lit. W. Nägeli
Weitere Untersuchungen über die Windverhältnisse...



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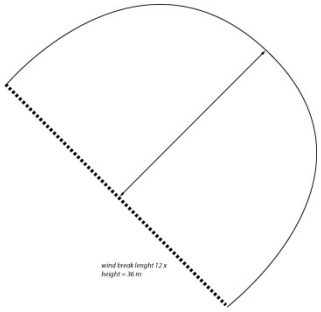
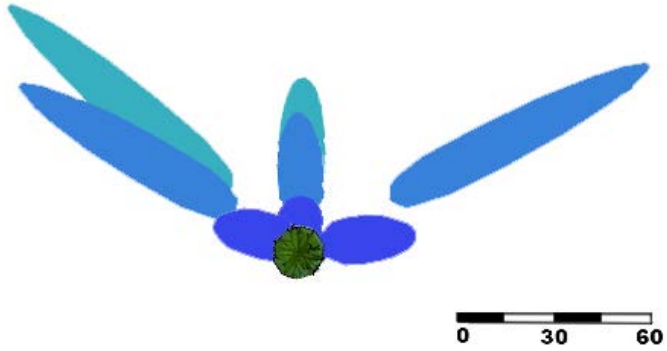
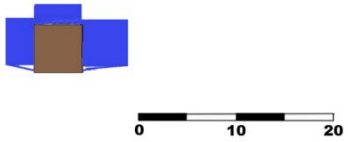


lit. W. Nägeli, adapted from visual information in Watson, D. 1983

- solar radiation impact:/ shadow patterns





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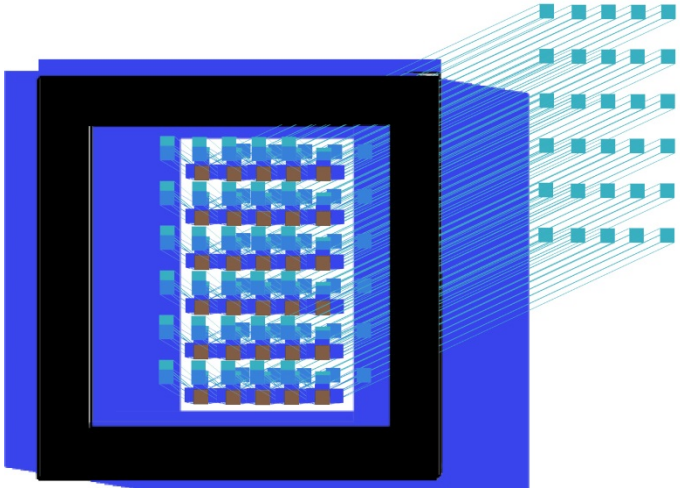

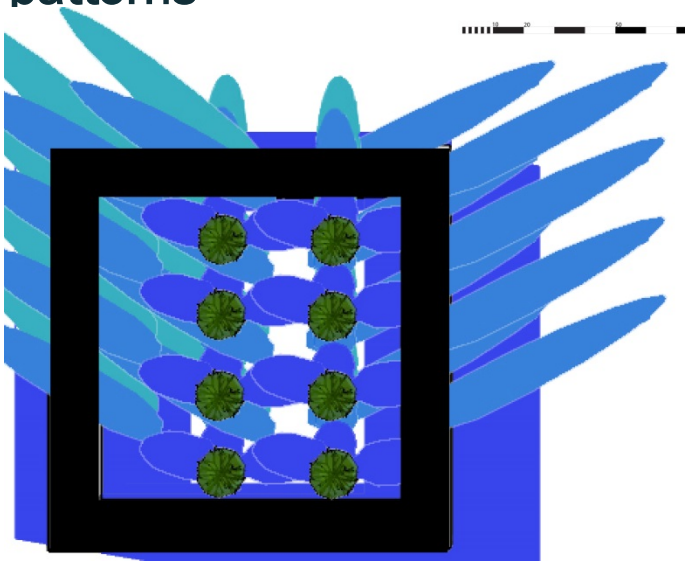

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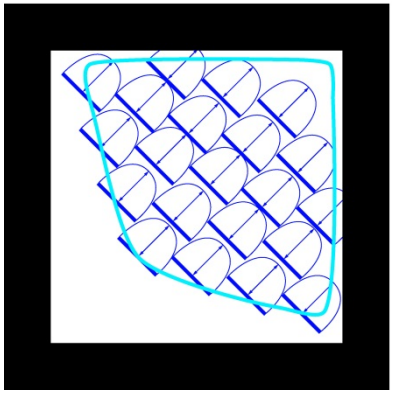
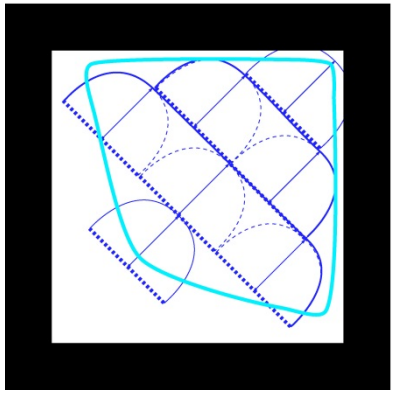
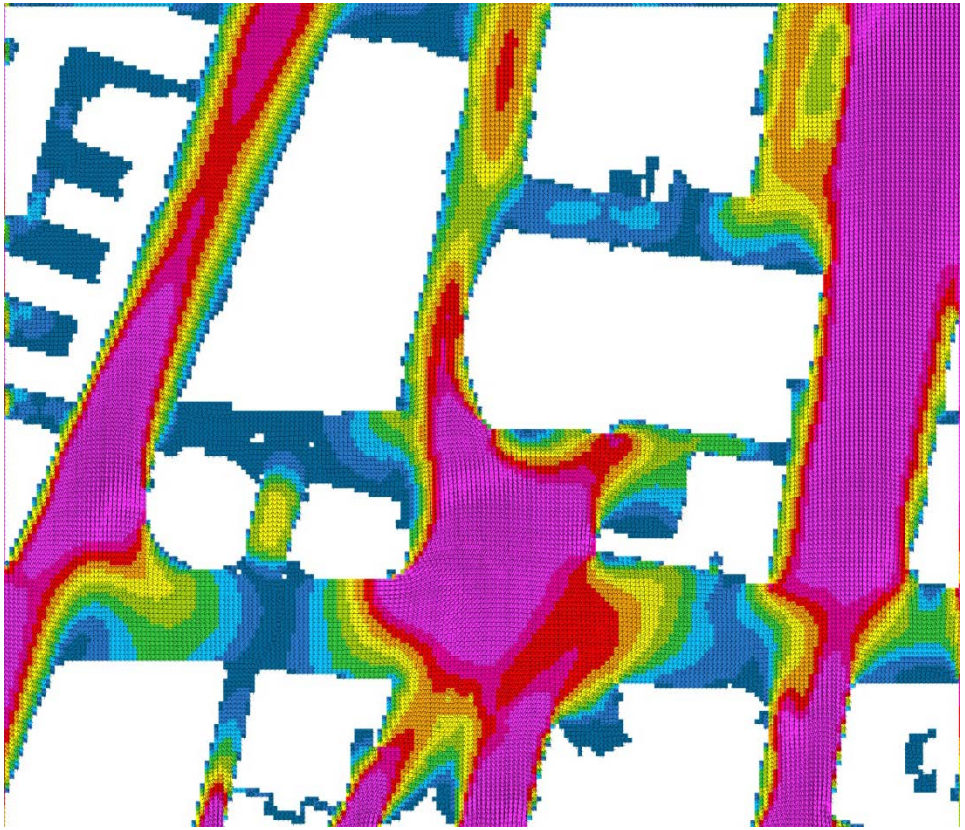
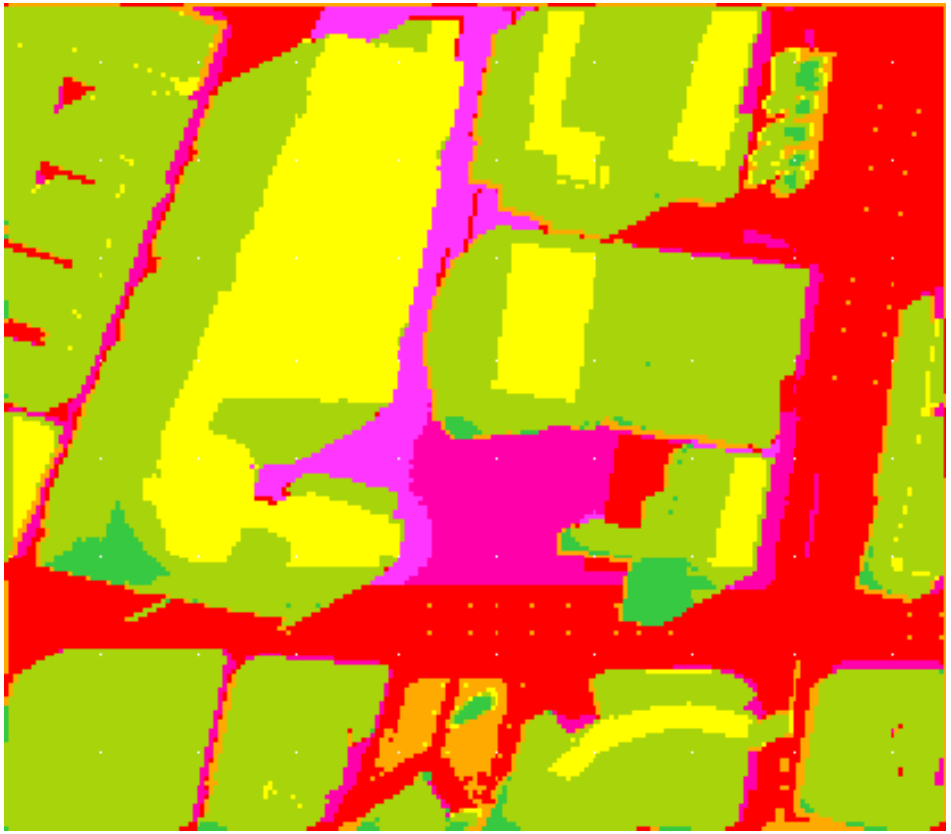




Example 2: Thermally comfortable Dutch squares

Existing situation of one case squares: Spuiplein, Den Haag





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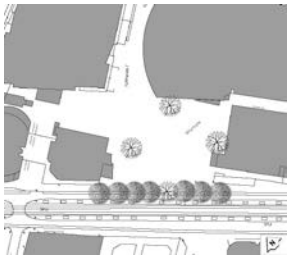
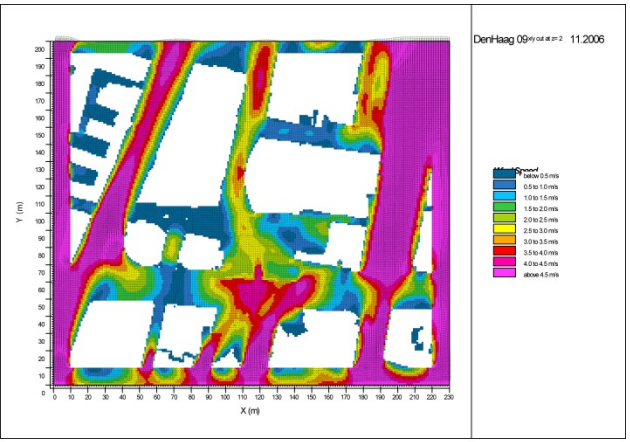
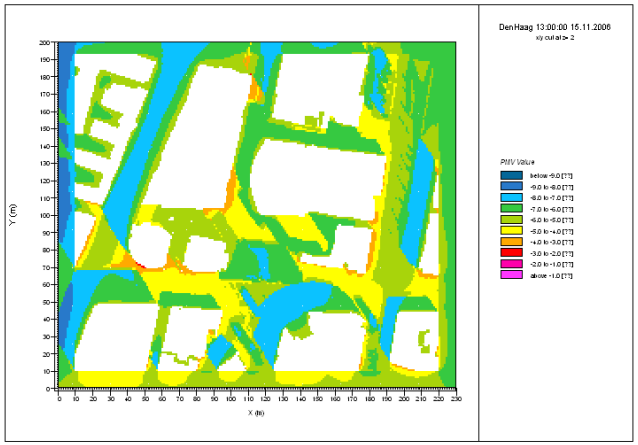
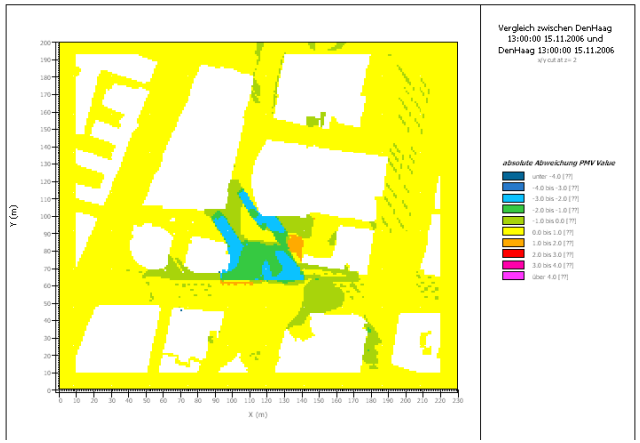
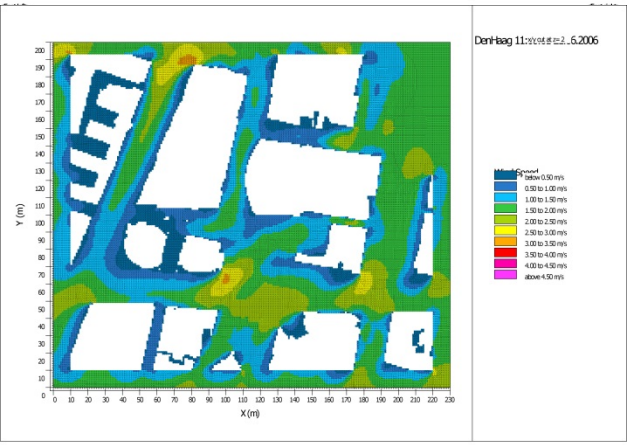


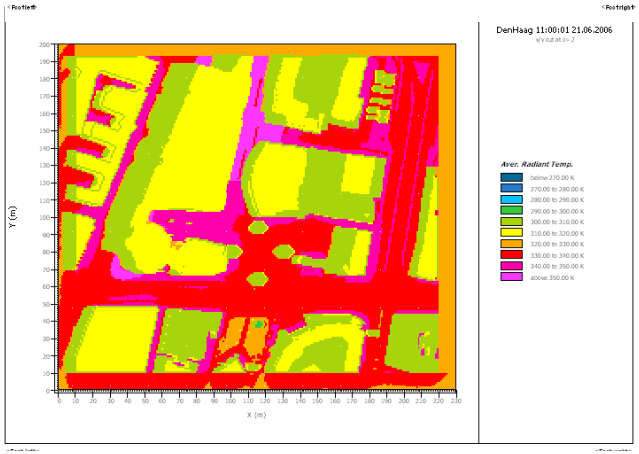
‘urban shelterbelt’, 15 m tall and 40 x 40 m grid of 15 m tall shadow trees, projected on Spuiplein, Den Haag

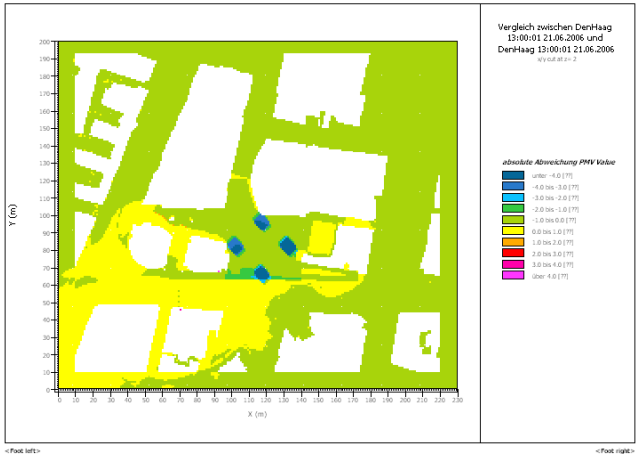












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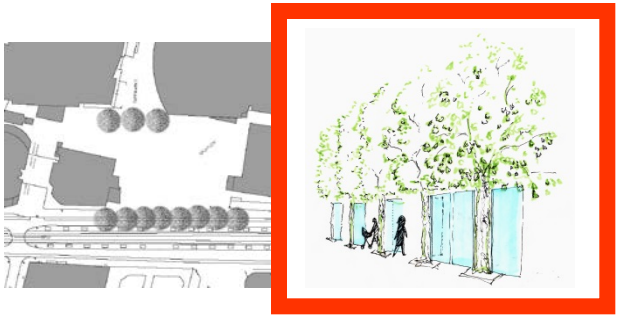
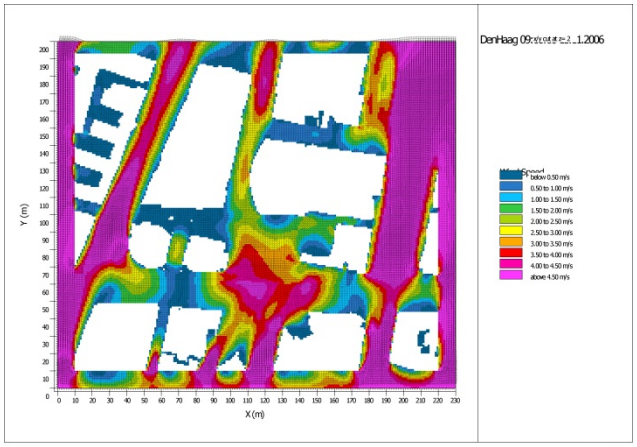
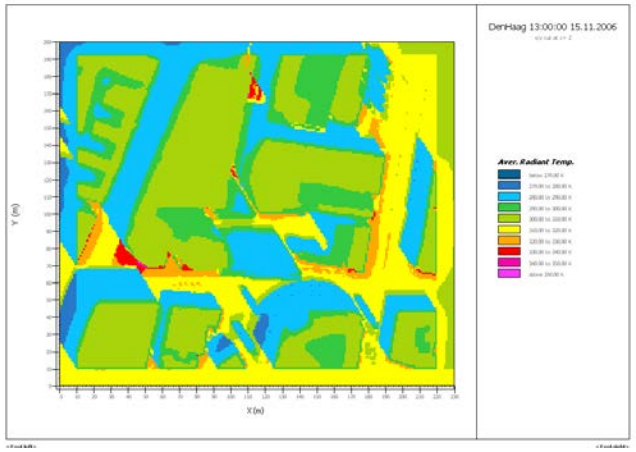
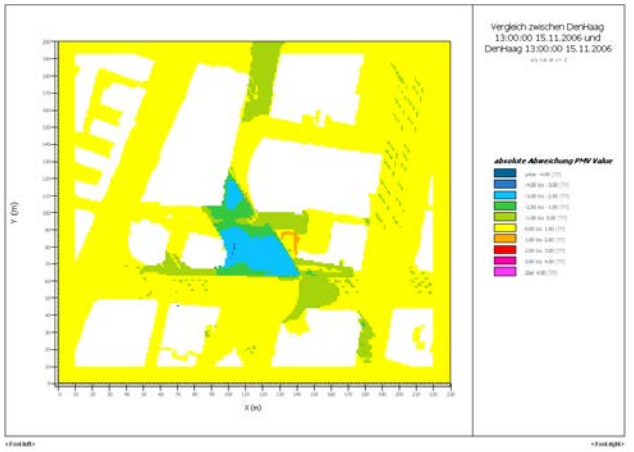
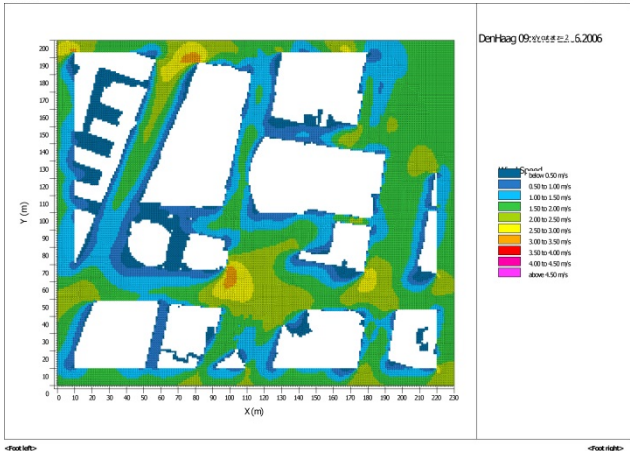


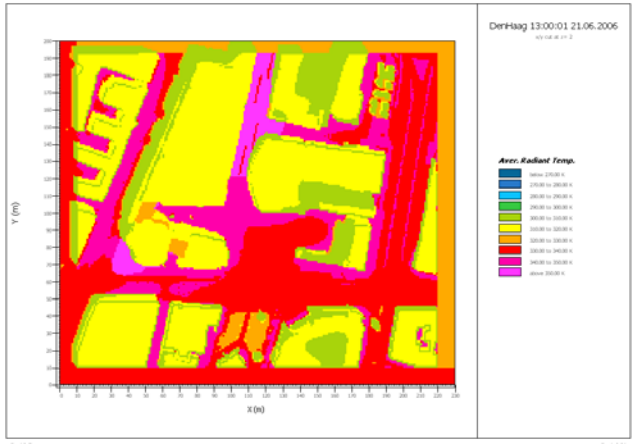
‘urban shelterbelt’, 25 m tall in 50 m sequence, projected on Spuiplein, Den Haag

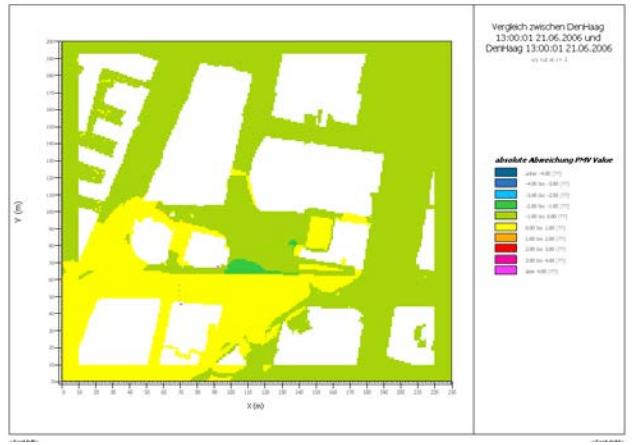








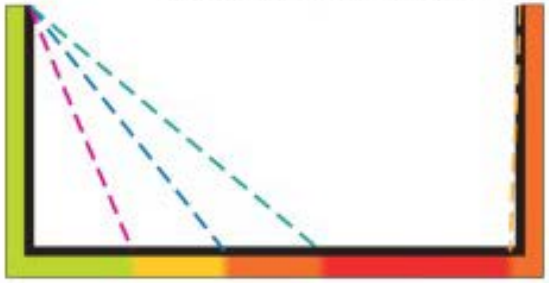




Example 3: ‘Cool’ distribution of trees in street profiles

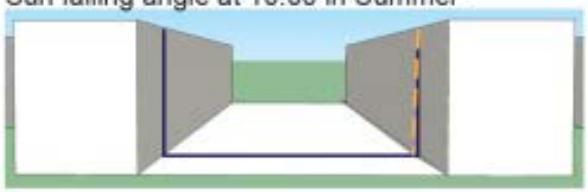
Shadow pattern calculating EXAMPLE for NW-SE canyon orientation, ratio 1:2

Summer shadow pattern



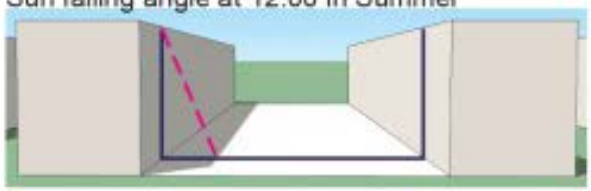
Winter shadow pattern

Sun falling angle at 10:00 in Summer

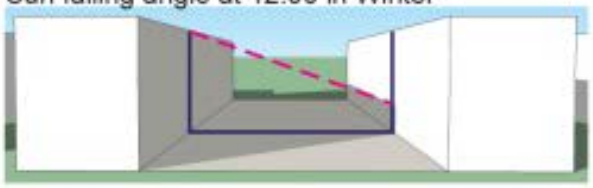


Sun falling angle at 10:00 in Winter

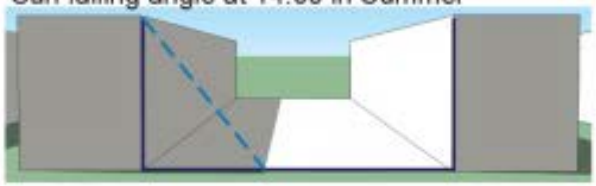
Sun falling angle at 12:00 in Summer



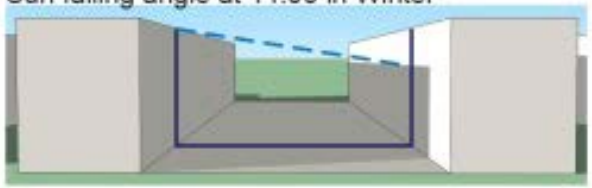
Sun falling angle at 12:00 in Winter



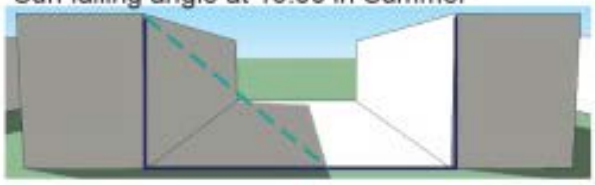
Sun falling angle at 14:00 in Summer



Sun falling angle at 14:00 in Winter



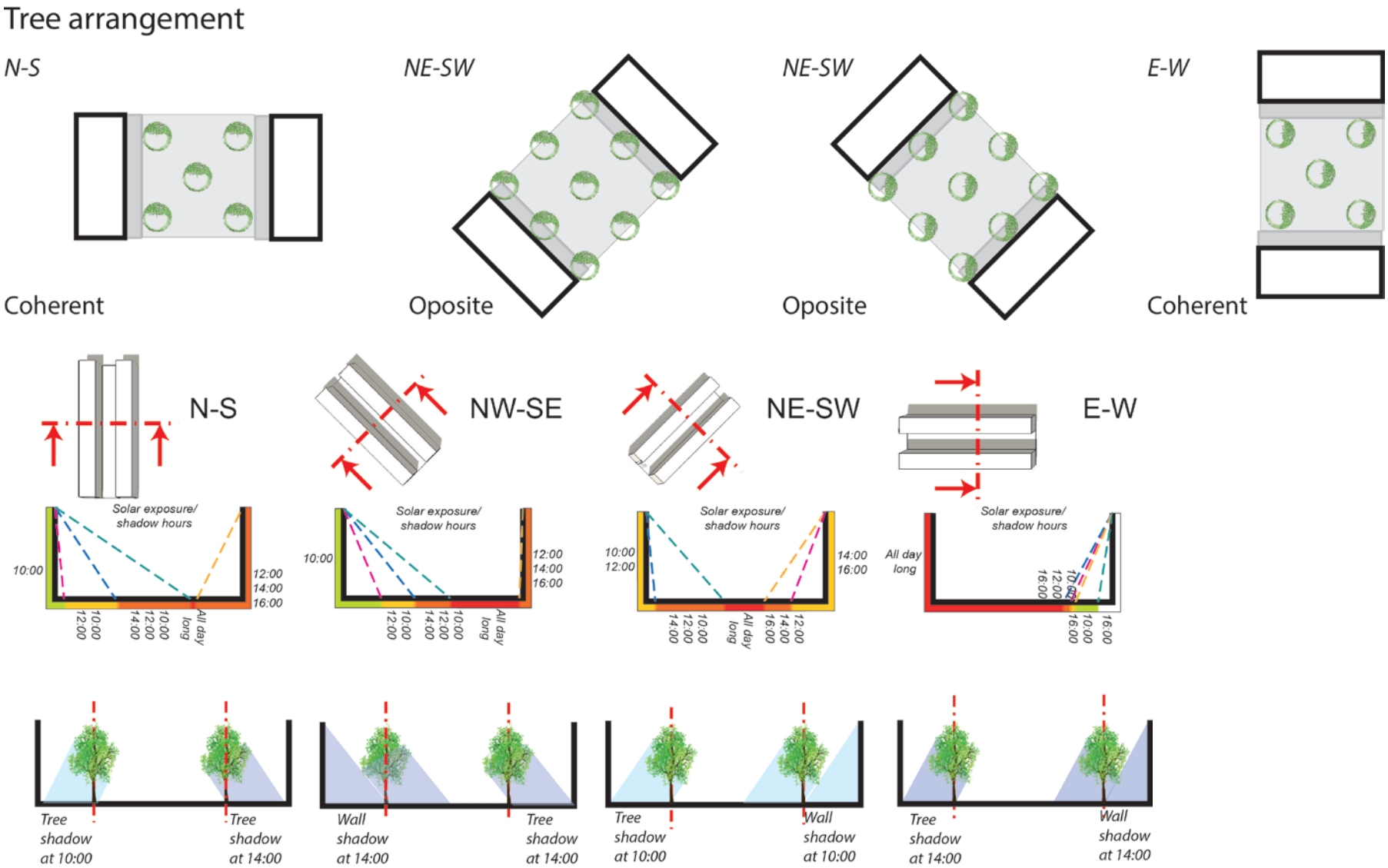
Sun falling angle at 16:00 in Summer



Sun falling angle at 16:00 in Winter

Source: Hotkevica, I. 2013

Example 3: 'Cool'distribution of trees in street profiles



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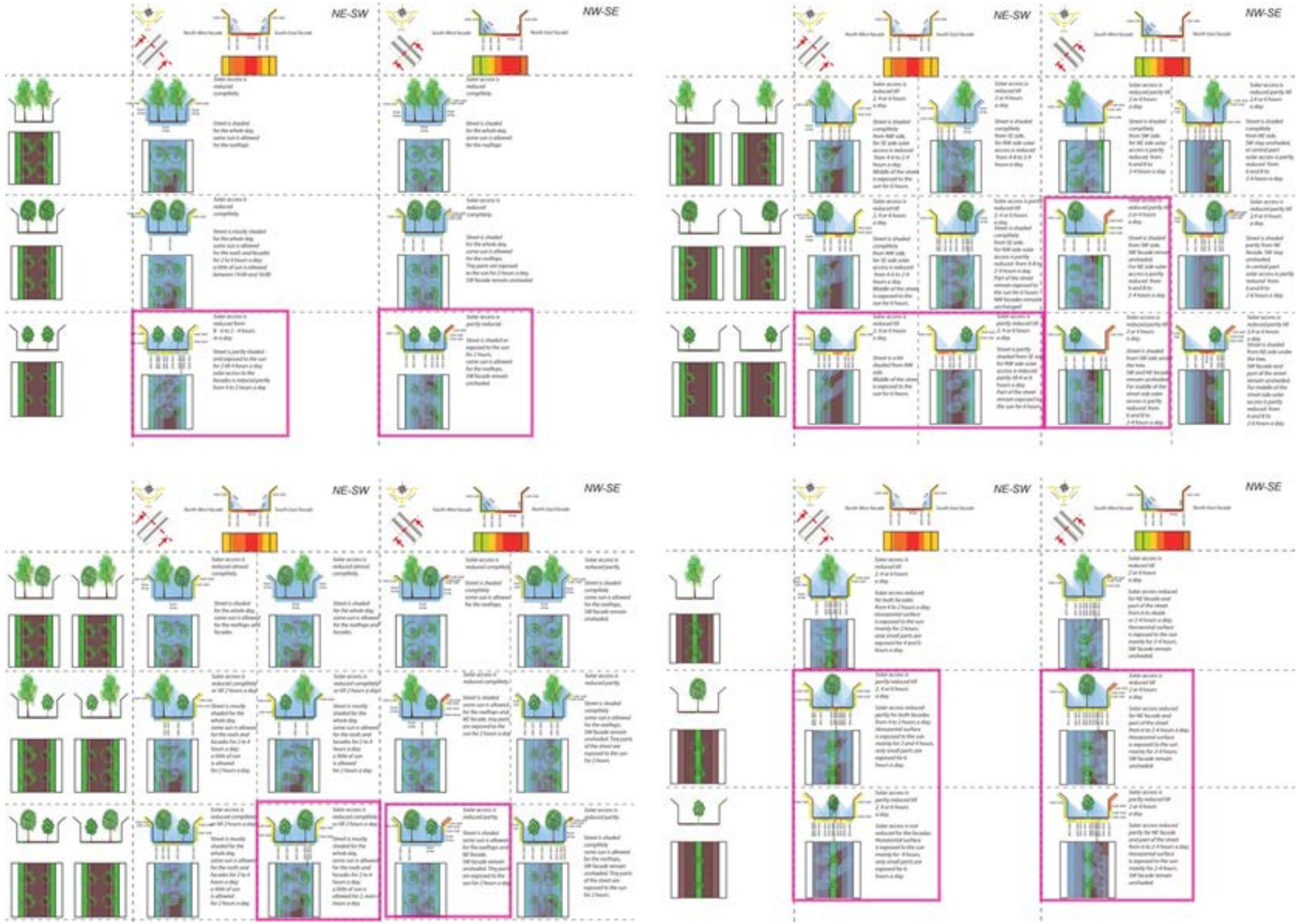
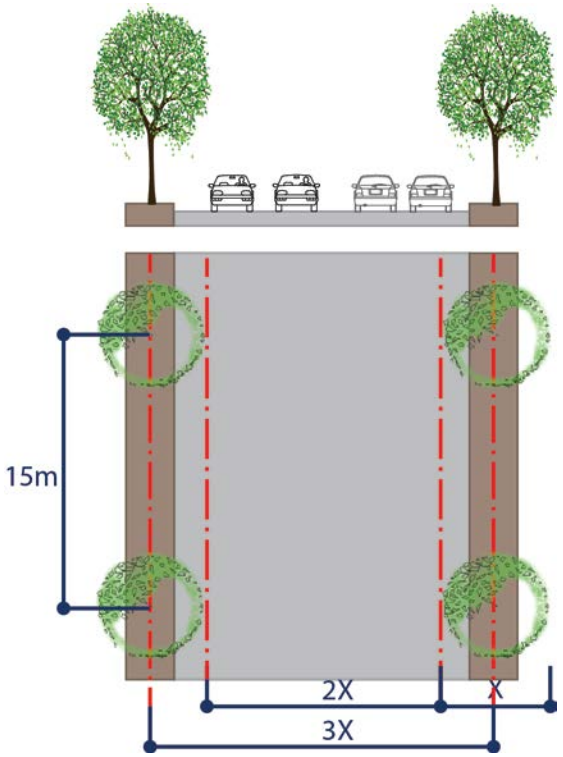
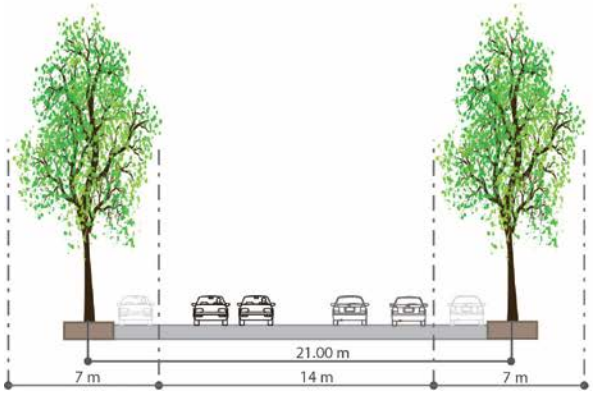


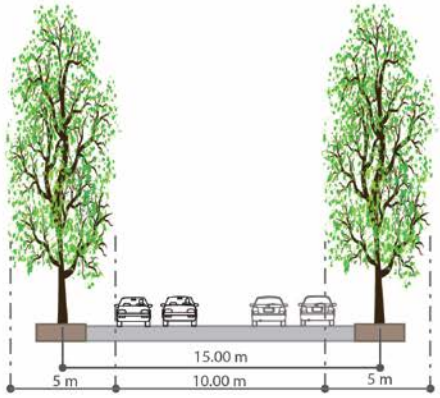
Example 3: ‘Cool’ distribution of trees in street profiles

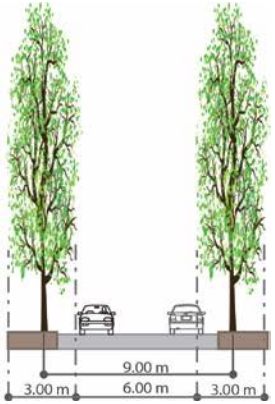
Possible limitations

Solutions for the streets with heavy traffic







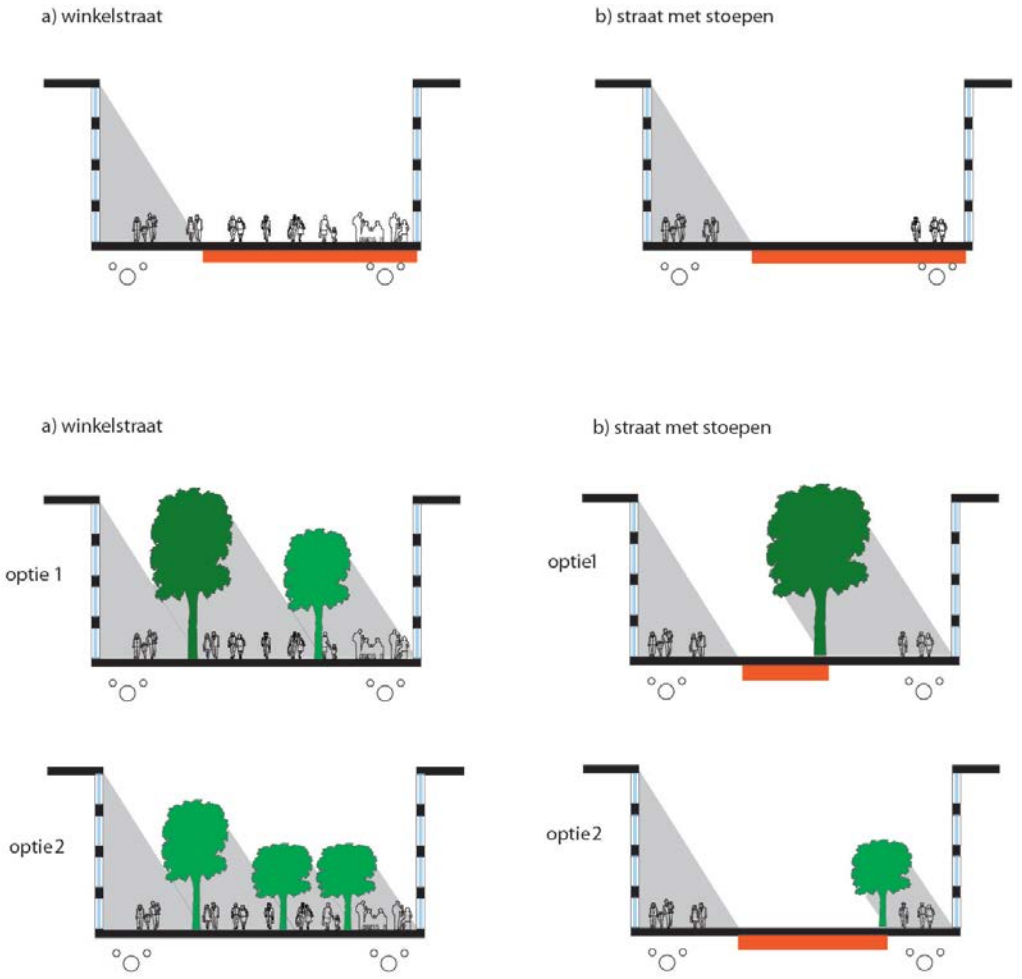


Source: Hotkevica, I. 2013

Example 3: ‘Cool’ distribution of trees in street profiles

Possible limitations

Situating the trees related to underground infrastructure



Source: Lenzholzer, S. 2013

Conclusions

1. All the examples brought about new 'positivistic' design knowledge
   ('objective', deductive/ generalizable, quantitative, verified design guidelines or prototypes)

2. All examples complied with the criteria for positivist RTD methods
   (design hypothesis testing, design experiments tested with surveys, simulations or measurements, systematic and strict procedure)

3. In all examples designs were tested on 'positivistic' criteria
   ('objectivity', validity, reliability, generalizability)

4. Positivistic RTD are useful to develop new design knowledge (guidelines and methods) to tackle challenges of climate change because of their reliability

5. A limitation of positivistic RTD is the generalizability of its results. Often, these general design guidelines need further adjustment to local situations and deeper research into the locality. Alternatively, 'mini' RTDs within the design process can be valuable and deserve much further research

RTD can only be done by designers to contribute to general knowledge production! We're needed!