Designing with the sun

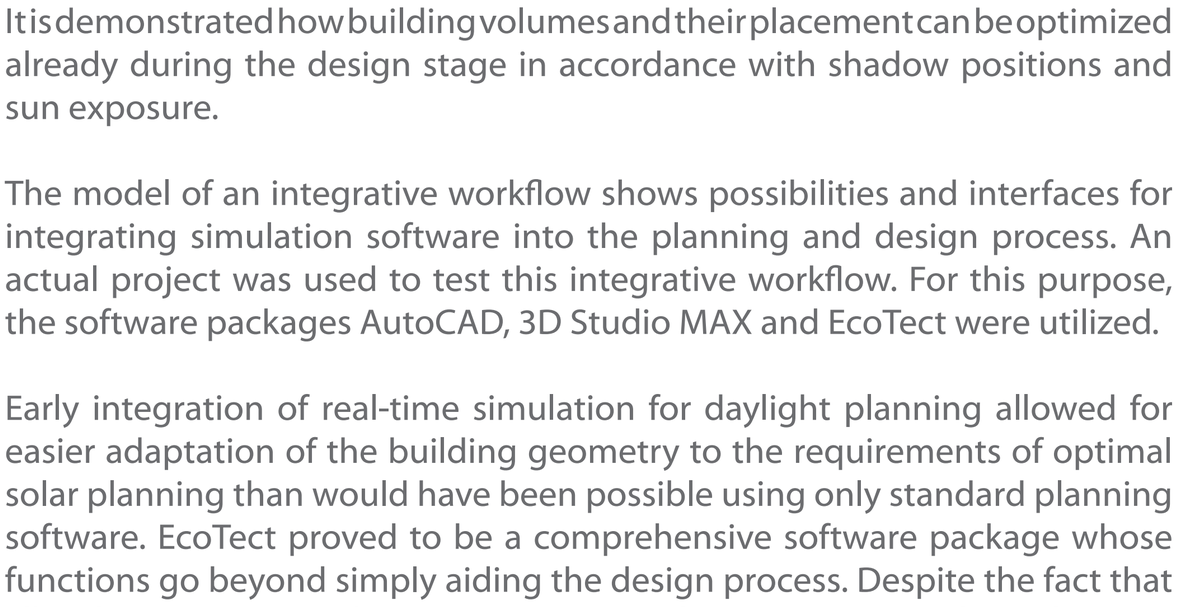
Integrative workflow and solar simulation with AutoCAD, 3D Studio MAX and EcoTect

This paper examines new computer-aided tools used by architects for daylight planning.The emphasis is on integrating real-time applications for solar simulation into the design and planning process.

It is demonstrated how building volumes and their placement can be optimized already during the design stage in accordance with shadow positions and sun exposure.

The model of an integrative workflow shows possibilities and interfaces for integrating simulation software into the planning and design process. An actual project was used to test this integrative workflow. For this purpose, the software packages AutoCAD, 3D Studio MAX and EcoTect were utilized.

Early integration of real-time simulation for daylight planning allowed for easier adaptation of the building geometry to the requirements of optimal solar planning than would have been possible using only standard planning software. EcoTect proved to be a comprehensive software package whose functions go beyond simply aiding the design process. Despite the fact that all software was developed by one manufacturer, the interfaces for data transfer and the modelling tools for this purpose can still be improved.



Ideal integrative workflow as a flowchart (software independent)

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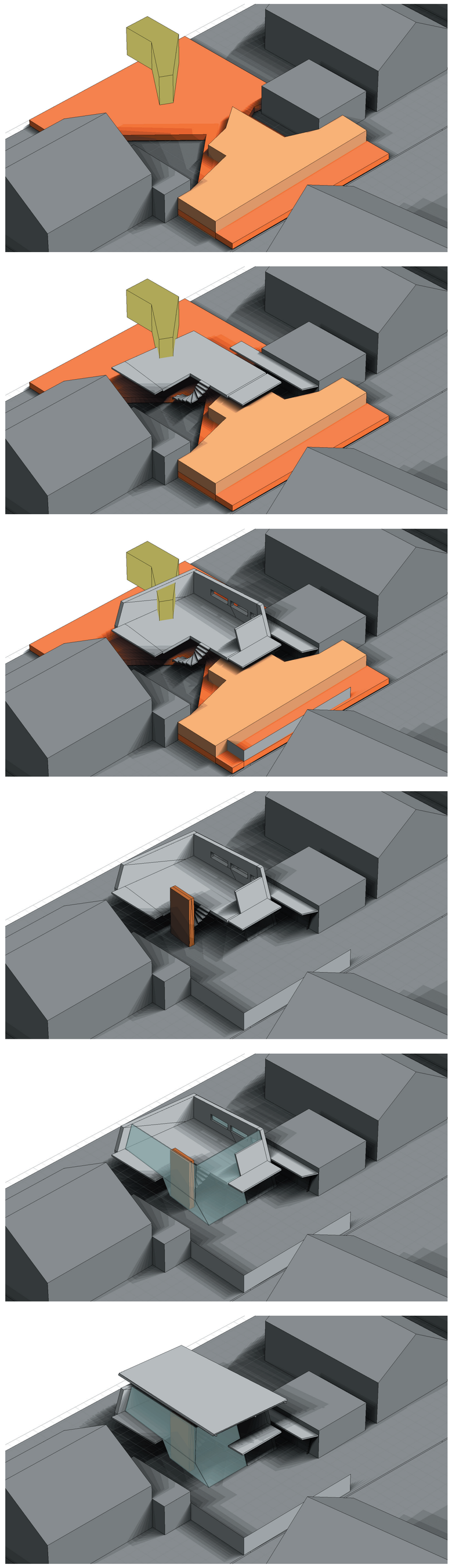

Designation of zones with maximal sun exposure (coloured) and adaptive building design (grey) coupled with with shadow analysis. Simulations using EcoTect . Computer generated images (CGI)

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