Extension to the head office of SOKA-BAU, the pensions and benefits fund of the German building industry, in Wiesbaden
A new multi-use building with offices, restaurant, conference, computer center - 1994-2004

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Photo: R.Nikolic

Open spaces between office buildings

GENERAL DESCRIPTION OF THE PROJECT

This programme encompasses a large total volume of space, arranged in buildings of varying heights and depths that offer flexibility to the users and present an appropriately proportion to the surrounding urban environment.
Approximately 70,000 m2 of space was built, with a floor space index of 1.71.
The arrangement of the communication cores enables the space to be let in small individual units, or in larger sections, by linking up the smaller units in horizontal or vertical directions.
Floors slabs play both an active and passive role in heating and cooling the building. As a result there are no suspended ceilings or double floors. In winter these solid components are heated, in summer warmth is extracted from them.

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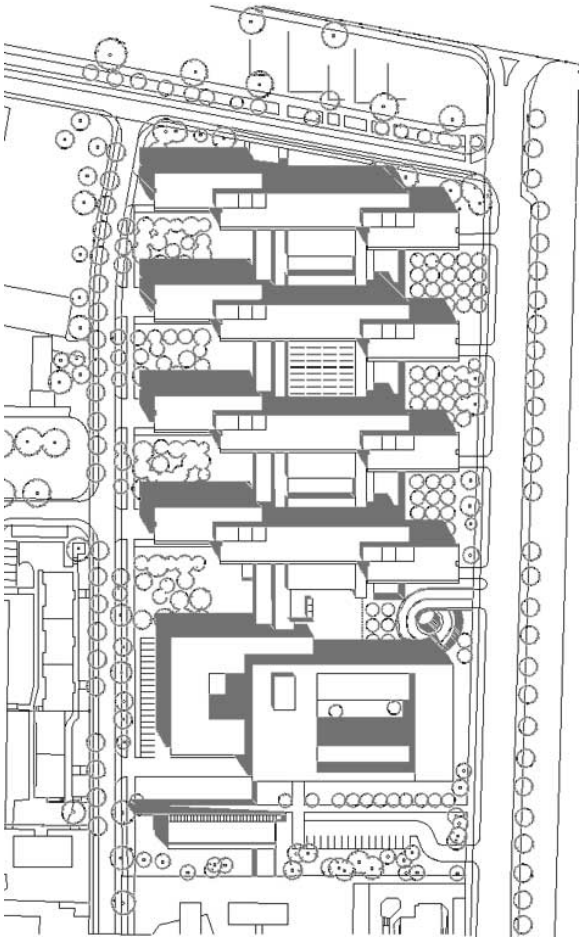

Plan view

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Cross section

To enjoy room-high glazed façades, the ceilings cantilever to form fire protection and maintenance balconies. In front of the south façades an adaptable two-wing structure has been installed to manipulate the daylight effects.
When sunlight falls on the south side, the computer-controlled, light-deflecting “wings“ move into shade position.
An assemblage of concave louvers reflects direct sunlight in the required quantities into the room. The energy gain this gives rise to is minimised to avoid overheating in the offices in summer. The lower wing moves down to shade the lower part of the façade. Its shape and position are designed to give as unimpeded a view out as possible.
A light-deflection panel was fixed to the balconies to direct zenith-light into the back of the rooms.

The following measures were taken to ensure a high comfort with low energy values:

- Heating or cooling of the concrete ceilings
- Low heat radiation loss due to triple glazing
- Hygienic air due to free natural ventilation
- Natural room illumination through daylighting
- Computer work places free of blinding
- Low fatigue due to prevention of disturbing light contrasts
- Good sense of orientation due to glazing to the corridors and a room-high glazing to the outside
- Flexible furnishing

INNOVATION IS PRIMARILY A PROCESS:

Architects and engineers developing new technical concepts work with new tools, materials and testing methods like wind tunnel tests, solar station and 1:1 models.

SOKA-BAU AS AN EXAMPLE:

- Completely innovative invention and realisation of a new kind of “intelligent façade“ with extremely high performance to reduce fossil energy consumption

- Automatically moving outer screen as secondary facade layer for shading (upper position in section) and daylight reflection (lower position)
- Highly insulated user-controllable wooden panels in each module of the façade.

Photo: P.Bonfig

Daylight reflector with light - shelf - effect

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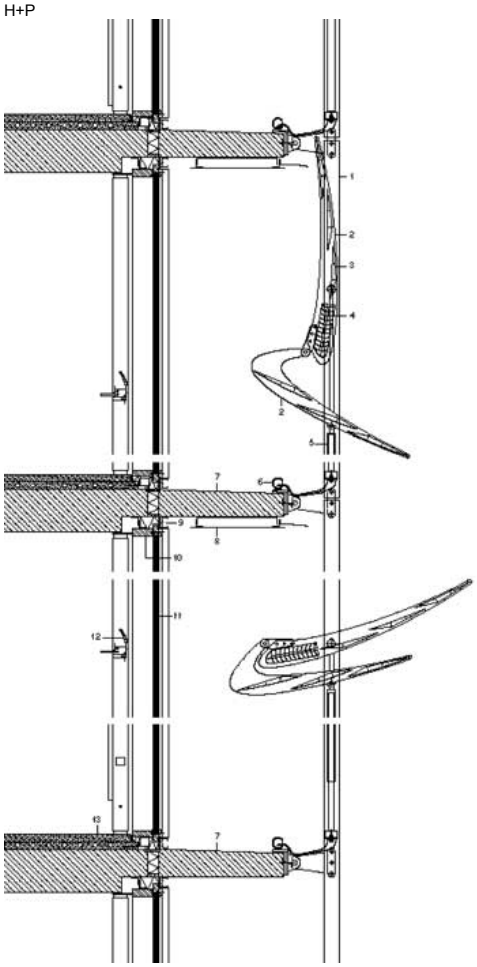


Vertical section through south façade

Photo: R.Nikolic

Inner façade, integrated installations

- The integration of considerable parts of the building installations into the outer wall construction is a main innovation. On the inside of the façade, at table height, there are wooden cabinets which contain the high and weak voltage supply for the individual workplaces. A little convector at the back, facing outwards, heats up the outside air in winter, which enters via four little vents placed in large wooden wings serving for natural ventilation in summer.

- New development of zenith-lit skylight components in linear form to bring daylight into the large inner areas of the building avoiding direct sun radiation.

- The building has been arranged as to enable natural cross-ventilation to pass lengthwise.

- Rainwater is collected and can be used for the green areas of the roof gardens and the courtyards.

TECHNICAL DATA:

Start of planning phase:	1994
Completion:	2003
Building Area:	170 m x 108 m
Floors underground in the East:	10.5 m
Floors underground in the West:	5 m
Number of floors overground:	5
Building height:	21 m
Total gross area without underground car park:	56.150 m^2
Number of work places:	app. 2000
G-value of the south façade:	6%

Statistical energy values of the new building

Heat consumption: 39 kWh/m^2/a
= app. 4 l of heating oil or 4 m^3 of gas/m^2/a

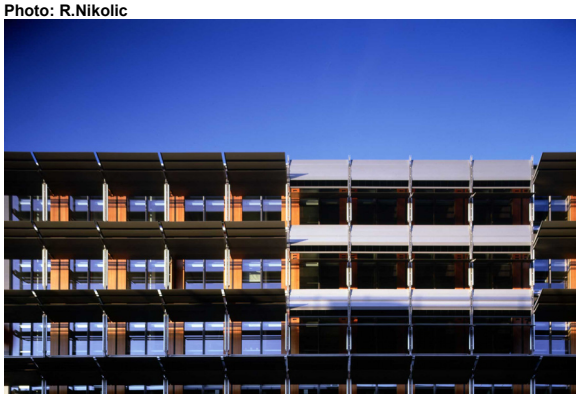
Cooling demand (without computer center): 18 kWh/m^2/a

Electricity consumption (without special areas of use): 75 kWh/m^2/a

Primary energy consumption for heating, cooling, ventilation and illumination: less than 90 kWh/m^2/a

In a two-round competition in 1993/94 the contribution of Herzog + Partner (Thomas Herzog and Hanns Jörg Schrade) was awarded the first price. After completion the team of architects and engineers was elected for their joint works by an international jury to be one of the two winners of the “European Architecture + Technology Award 2006”. Every three years this price is given to a realised project of outstanding architectonical quality related to sustainability, flexibility and user orientation. (In 2006 there have been entries from twelve countries.)

Photo: R.Nikolic



South façade, shading open and closed

A monograph on this project will be published by Prestel (Munich, London, New York) in autumn 2006, providing extensive information on the relevant results of the technical and architectonical details.