

Are you an Owner, Investor, Developer or Architect?

Do you want to build new or refurbish?

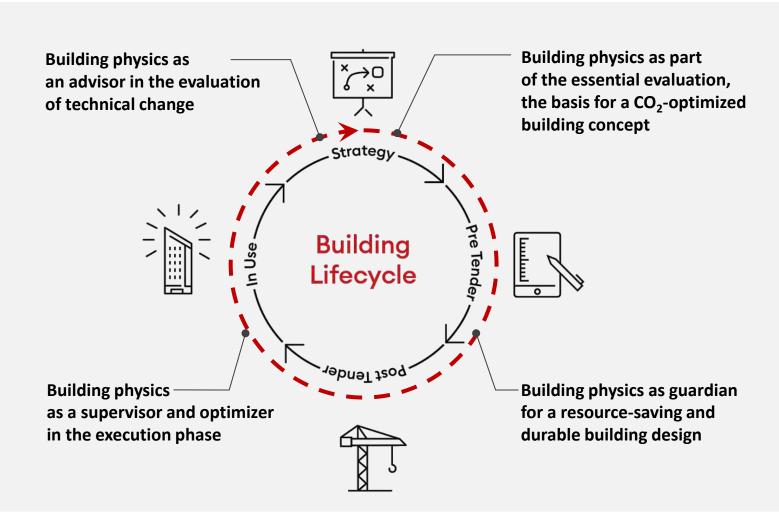
We close the loop

There are many specialists; it is a matter of linking the knowledge.

Why Priedemann-Building-Physics? There are many building physicists.

Priedemann building physics and building acoustics that is linked knowledge at the interface between the building envelope, building services and environmental conditions, all from a single source, with special expertise in the building physics of the facade.

Take advantage of this, simplify planning coordination and shorten your planning processes.



We step in where you need us. The decisive factor is an optimal start because the adjusting screws become smaller in the end.

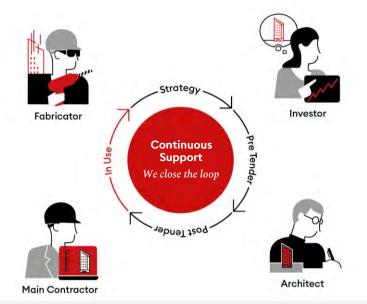
Continuous Support

This means taking responsibility for the planning, implementation and use.

At Priedemann, we take care of facade consulting AND engineering. In this way, we close the gaps between planning and execution.

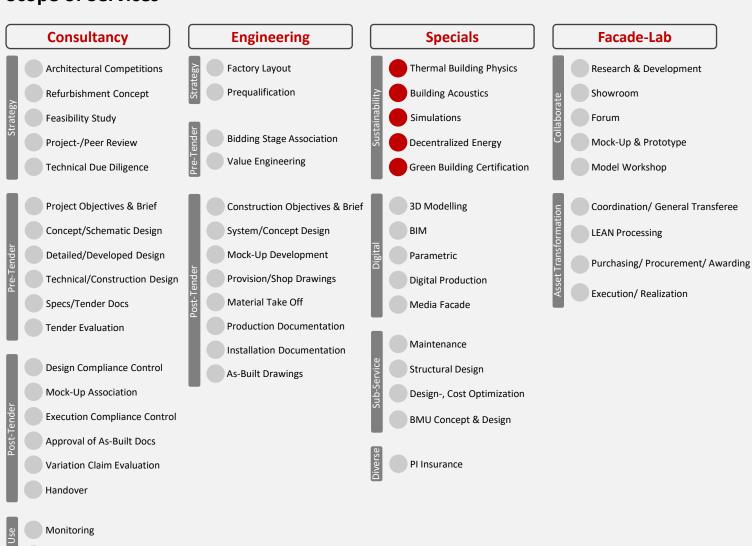
We ensure that the project knowledge we have gained is transferred to the construction phase. In this way, you can rely on the ONE person responsible for the facade.

With this, we support the architect as design author and generalist on the building site and the client and investor as idea provider, initiator and financier.



Scope of Services

Defect-/Failure Investigation



More than just classic Building Physics

Consulting through all phases

Thermal Building Physics

- Energy verification
- Component Catalogue
- Heat flow calculations
- Radiation-physical characteristics of glazing and solar control systems
- Shading analysis |
 Sun position analysis
- Design Compliance Control
- Execution Compliance Control
- Building and component simulations
- Thermal building simulation
- Hygrothermal simulation
- Decentralised energy generation
- Photovoltaics & Solar Thermal
- Green Building Certification
- Energy verification
- Energy Performance Certificate

Building acoustics

- Noise protection
- Noise immission control
- Room acoustics
- Execution Compliance Control | Measurements



for





Thermal Building Physics

energy-economic, structural, and hygienic thermal insulation

Wherever a building component borders on different temperatures, air humidity or airflow, physical processes take place and damage can occur; everywhere, thermal protection or comfort can be insufficient, or the energy losses are unacceptable.

Computersimulation der Wärmestromberechnung im Atrium

Based on the overall energy balance, energy standards, and environmental conditions, we develop the specifications for the entire thermal building envelope and all relevant components' layered structure.

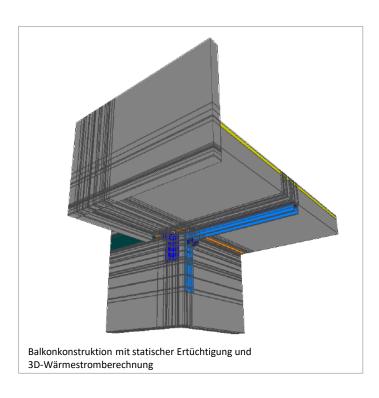
In this way, we avoid unnecessary heat loss, excessive heat input and moisture damage. Moreover, considering the building services concept, we create the basis for comfortable lowenergy buildings.

Energy standards

Applying energy standards or low and passive house requirements is routine for us.

Minimising CO₂ emissions and reducing resource consumption is what drives us. Therefore, we are happy to advise and plan what makes sense to achieve green building certification, such as DGNB, LEED or BREEAM.





Total Energy Balance

We determine the necessary values from building services and the entire thermal building envelope and calculate the overall energy balance of a building.

In residential buildings, the transmission heat losses of the building envelope play a unique role. We determine the specific heat losses and can thus advise the architect on how large the proportion of window area in the building envelope may be.

Isotherm progression and thermal bridges

We analyse the isothermal curve within a planned or executed construction and calculate 2- or 3-dimensional thermal bridges. This enables us to identify weak points and suggest solutions to prevent condensation and eliminate the risk of possible mould growth.

Material Consideration

We calculate the necessary U-values and resulting insulation thicknesses, make specific material suggestions considering sound insulation and fire protection; we give advice on the correct wall structure and determine the g-values taking into account the measures selected to provide protection from the sun.

Component structure with layered structure

We create a catalogue for the entire building or selected components, which shows each element with its layered structure, material qualities and the respective building physics specifications.

Acoustic and fire protection requirements can be added. In this way, those involved in planning receive a clear list of the individual building components, which can also be used as a specification for awarding contracts.

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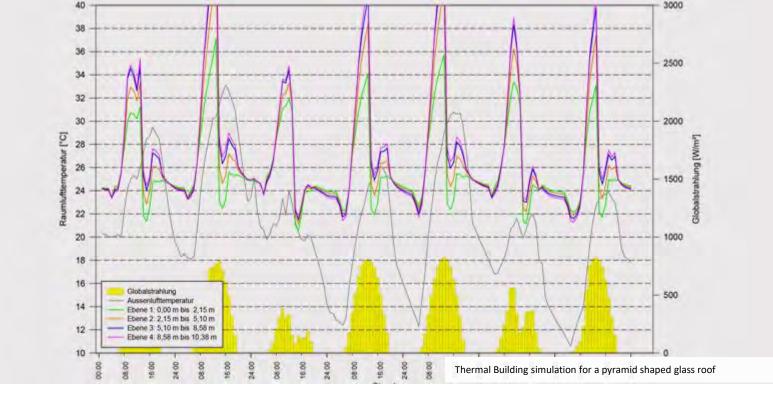
Wärmedurchgangskoeffizient (U-Wert): $U = 0,28 \text{ W/m}^2 \text{K}$ bewerteter Norm-Trittschalipegel: Bauteil ohne baurechtliche Anforderung bewertetes Schalldämm-Maß: Bauteil ohne baurechtliche Anforderung

Anforderungen und Hinweise zu den oben genannten Schichten des Bauteilaufbaus

- 1 Rutschhemmung: nach Angabe Architekt
- 3 Calciumsulfatestrich als Estrich auf D\u00e4mmschicht (schwimmender Estrich) nach DIN 18560, Teil 2 Vor Verlegung der Steinbel\u00e4ge muss der Estrich geschliffen, grundiert und gespachtelt

werden. Estrichbewehrung nach allgemein anerkannten Regeln der Technik.

Auszug aus einem Priedemann Bauteilkatalog



Building Simulation

Anticipating complex realities through digital simulation tools

Thermal Building Simulation

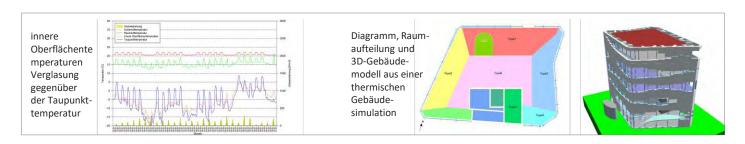
Buildings, their function and construction and their technical systems are becoming increasingly complex. As a result, standardized calculation methods are often insufficient to determine or optimize energy or building physics values. Here we rely on various simulation tools. We integrate the building model, the building services concept and all exterior and interior components and climate data into our programs.

We can thus determine the comfort values according to ISO7730, the heating and cooling loads for a building or different variants to find the best solution. The focus is often on the operative room and max room air temperature or the maximum number of hours in which these values are exceeded.

Flow Simulation

How comfortable are the temperatures on the galleries of a multi-storey atrium, or where do which airflow velocities prevail in a mall, how is the climate distributed in such complex spaces, what changes is it subject to during the course of the day and the seasons, or with changing conditions of use?

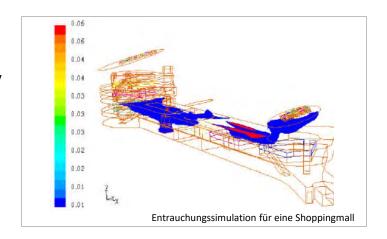
To analyze such complex systems and processes, we use 3-dimensional flow simulations (CFD Computational Fluid Dynamics). To do this, we transfer the 3D data of the building model into CFD-readable data. With the energy and building physics values and the weather data, qualified statements can then be made for further planning.



Smoke extraction scenarios

The verification of the necessary smoke extraction and air leakage cross-sections can be carried out by calculation but often do not do justice to the concrete conditions.

By using CFD programs, the cross-sections and the number of smoke extraction openings can often be reduced, or their arrangement optimized.



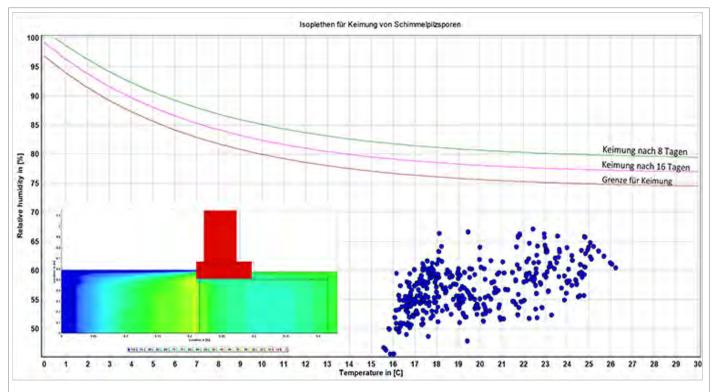
Hygrothermal Simulation

Moisture balancing is useful for determining possible condensation within structures in order to avoid planning errors and structural damage.

For specific components, the so-called "Glaser method" cannot be used as a simple method of moisture protection with vapour diffusion calculations; it would even lead to incorrect results.

We assess and dimension such components in an overall balance of heat, moisture and mass transfer processes on an unsteady basis.

The transient moisture balance of the components is carried out in a one-dimensional or two-dimensional orientation and is performed according to DIN EN 15026.



3-jähriger Zyklus von Temperatur- und Luftfeuchtepaaren an der Oberfläche der inneren Fensterlaibung, sowie Isoplethen für die Keimung von Schimmelpilzen



Decentralised energy generation

Collecting and harnessing solar energy where it is generated

Save fossil energy, reduce operating costs, increase efficiency.

Worldwide, building operations consume about 1/3 of the total primary energy, more than 80 % of which is generated from fossil fuels, while energy demand is growing. In addition, energy generation is mostly centralized, while provision is via lossy supply networks.

The use of solar energy hitting the building envelope therefore seems more than sensible. In combination with solutions to use energy more efficiently, the consumption of fossil fuels is reduced.

Potential of solar façade systems:

today's façade systems can generate both heat and electric power

- facade areas are often larger than roof areas
- roof areas are often already intensively used by building services, terraces or plantings
- the residential sector mainly needs heating energy, the commercial sector mainly needs cooling energy and the industrial sector processes energy
- the highest cooling demand is when the solar radiation is at its highest; this source can be harnessed with solar cooling systems.

We determine the energy demand, evaluate the potential based on local weather data, the building location and orientation, and work out the concepts and solutions for façade-integrated energy generation together with the specialists involved.



Building acoustics

The power lies in the silence

Priedemann offers comprehensive expertise from the determination of noise level values and the resulting requirements for (facade) components to the preparation of noise protection reports and recommendations for the containment of sources of domestic noise. Our services cover the entire planning and execution process.

Calculating and adjusting noise level values

We determine the noise-level values that occur locally as the basis for planning the necessary noise protection and the required noise protection values for individual rooms, taking into account the planned use. We compare the values obtained with the legal and project-specific requirements.

Preparation of sound- and noise protection reports

We prepare sound and noise protection reports as part of the approval process.

Ambient noise level

We determine the ambient noise level and reverberation times in the room and give recommendations on sound absorption and the distribution of sound-absorbing elements and surfaces..

Requirements for the facade components

From this we can deduce the requirements for the facade components and recommend suitable constructions and material qualities. We take into account the flank transmission over adjacent components and spaces and influence the arrangement and design of the substructure, the choice of window and glazing types as well as the selection of materials and sensible arrangement of joins

Sound Absorption

We calculate the sound-absorption surfaces required and propose suitable sound-absorbing materials and surfaces as well as their positioning within the framework of a spatial concept.

Improving the intelligibility of speech: We develop ways to make speech intelligible and to avoid disturbing echoes in the room.

Sound Pressure

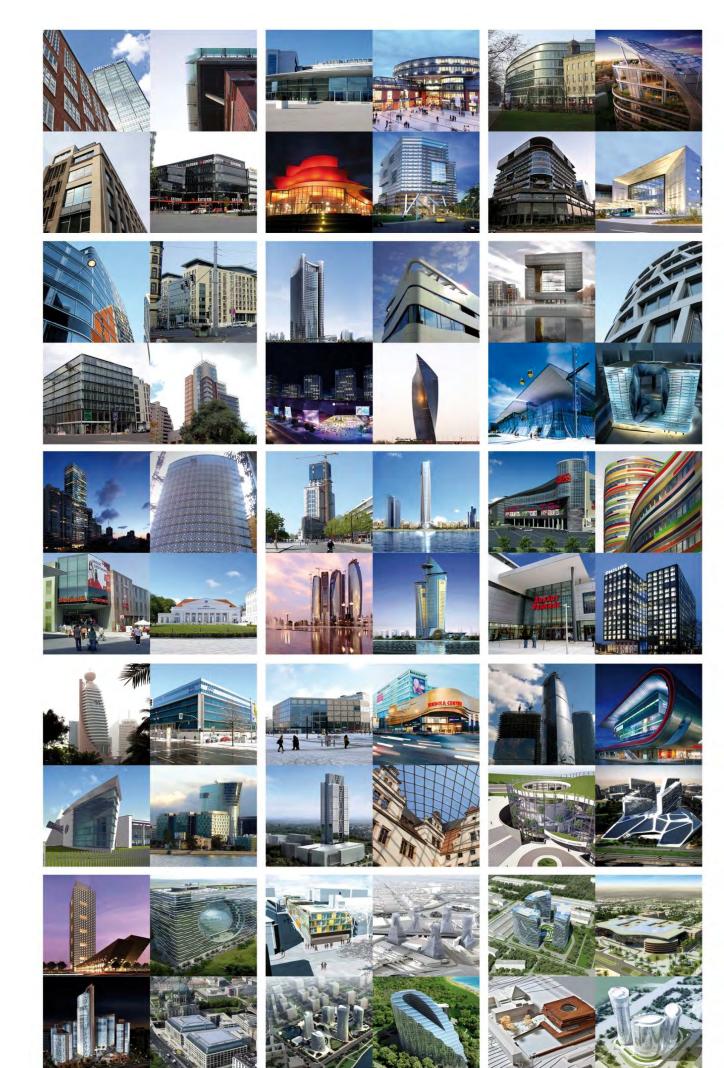
We define the structural conditions for the maximum permissible sound pressure level in rooms where protection is required.

Evaluation of internal Emission

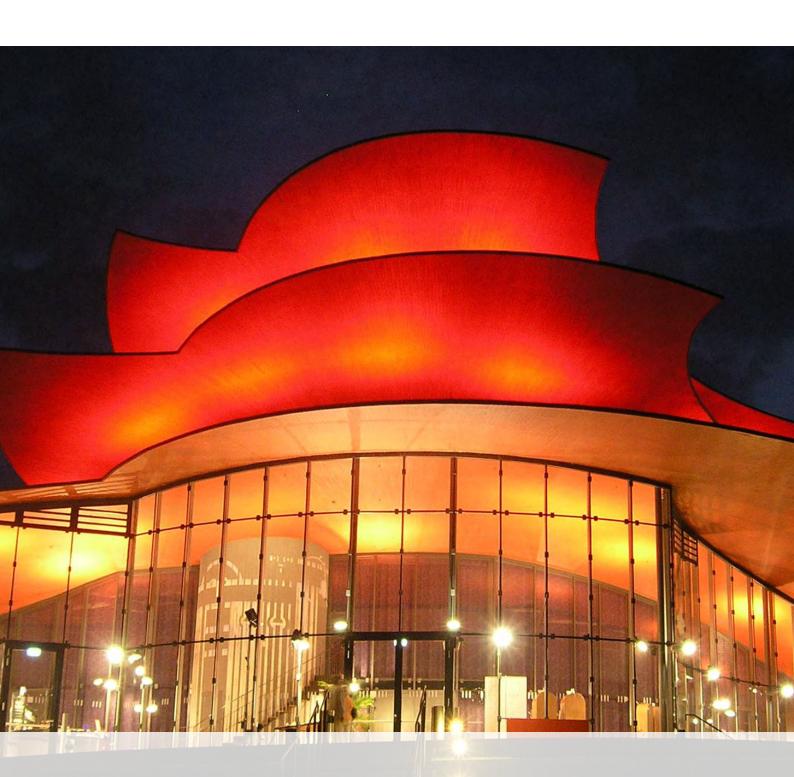
We evaluate the emissions of technical installations and give recommendations for compliance with the prescribed noise level values.

Improving the intelligibility of speech

We develop ways to make speech intelligible and to avoid disturbing echoes in the room.







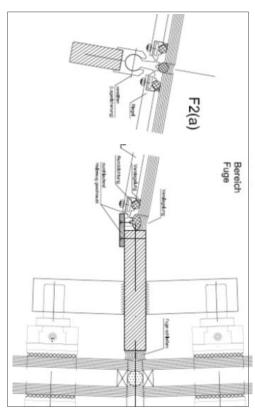
Thermal Building Physics & Acoustics

Reference selection

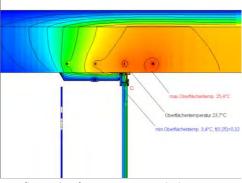
Hans Otto Theater Potsdam



Hans Otto Theater in Potsdam at twilight



Typical detailing



Heat flow and surface temperature calculation



Facade elevation of point fixed glazing

Client

Provincial capital Potsdam

Owner • Developer

Provincial capital Potsdam

Architect

Gottfried Böhm

Project Data

- approx. 21 m building height
- approx. 350 m² facade surface

Building Function

Theatre

Technical Features

- Polygonal steel facade, point-fixed glazing
- Double skin facade

Consultancy Services

- Project Objectives and Brief
- Concept/Schematic Design
- Technical/Construction Design
- Specification/Tender Documentation

Special Services

- Thermal Building Physics
- Simulations

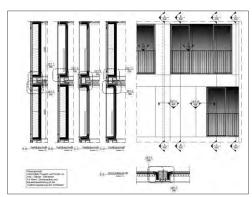
Status

Completed 09/2006

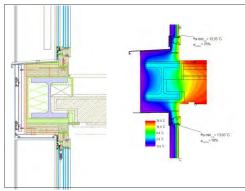
SKAIO Heilbronn



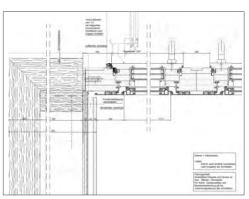
Visualization of SKAIO in Heilbronn



Typical detail overview, wood-aluminium windows



Therman Building Physics



Horizontal loggia detail, lateral connection



During construction progress

Client

Stadtsiedlung Heilbronn

Owner • Developer

Stadtsiedlung Heilbronn

Architect

Kaden + Lager

Project Data

- approx. 34 m building height

Building Function

Residential

Techniical Features

- Wooden skyscraper
- Rain screen, wood-aluminium, metal sheet
- Composite window, wood-aluminium integrated sunscreen
- Stick-system facade, wood-aluminium

Consultancy Services

- Project Objectives and Brief
- Concept/Schematic Design
- Detailed/Developed Design
- Technical/Construction Design
- Specification/ Tender Documentation

Special Services

Thermal Building Physik

Status

Completed 05/2019

priedemann 2024

CityQuartier DomAquarée Berlin



Aerial side perspective, inclined and bended glass roof glazing at the sides and foil roof in the centre



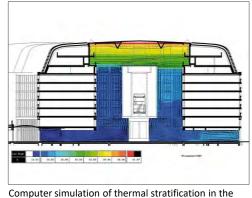
Foil roof structure as seen from below



Inclined and bended roof glazing, window cleaners at work



Foil roof junction



atrium

Client

DIFA Deutsche Immobilien Fonds AG

Owner • Developer

DIFA Deutsche Immobilien Fonds AG

Architect

nps tchoban voss

Project Data

- approx. 30 m building height
- approx. 50,000 m² facade surface

Building Function

Hotel, Office, Residential, Retail

Technical Features

- Fully glazed facade, inclined
- Stick system facade
- Integrated sunshade
- Natural stone facade
- Glass roof
- Foil roof

Consultancy Services

- Project Objectives and Brief
- Concept/Schematic Design
- Detailed/Developed Design
- Technical/Construction Design
- Specification/Tender
 Documentation
- Tender Evaluation
- Design Compliance Control
- Execution Compliance Control

Special Services

- Thermal Building Physics
- Building Acoustics
- Simulations
- Maintenance, Cleaning, Facade Access, BMU

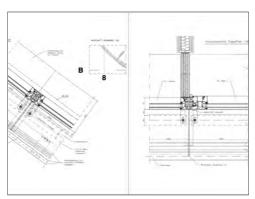
Status

Completed 04/2004

Eastgate Berlin



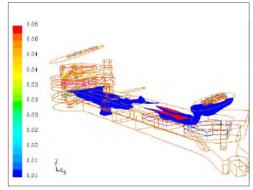
Eastgate Shopping Center in the evening



Typical detailing of stripped window with sunscreen



Curved aluminium standing seam profiles



Computer simulation for smoke extraction



Facade elevation with stick system and curved Kalzipprofiles

Client

ECE Project Development

Owner • Developer

Eastgate KG

Architect

- ECE Architects
- Granz Architects

Project Data

- approx. 18 m building height
- approx. 26,750 m² facade surface

Building Function

Shopping Mall

Technical Features

- Stick system facade
- Curved Kalzipprofiles
- Revolving doors
- Elliptical glass roofs

Consultancy Services

- Project Objectives and Brief
- Concept/Schematic Design
- Detailed/Developed Design
- Technical/Construction
 Design
- Specification/Tender
 Documentation
- Tender Evaluation
- Design Compliance Control
- Execution Compliance Control

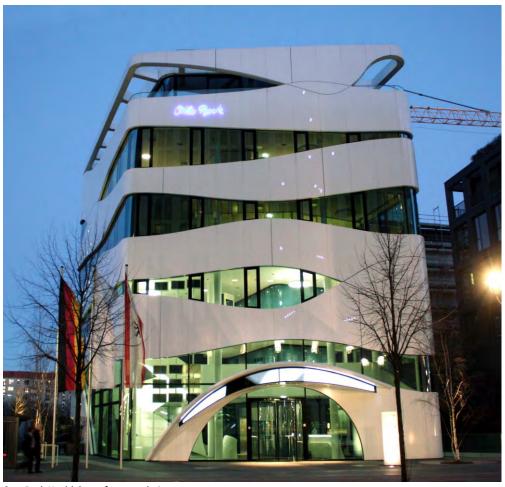
Special Services

- Thermal Building Physics
- Simulations

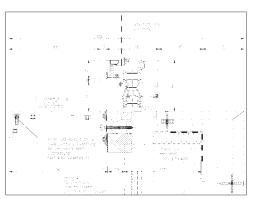
Status

Completed 10/2005

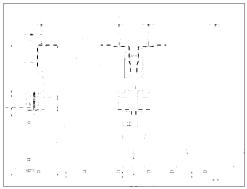
Ottobock Science Center Berlin



Otto Bock HealthCare after completion



Fixture of flashing - vertical section



Fixture of flashing – horizontal section



Facade elevation with a look at the building edge



Metal panel facade with stripped windows, inside elevation

Client

VITERRA Development

Owner • Developer
Otto Bock HealthCare

Architect

Gnädinger Architekten

Project Data

- approx. 22 m building height
- approx. 3,500 m² facade surface

Building Function

Competence Centre for Health Care Technology

Technical Features

- Stick system facade, straight mullions, curved transoms, aluminium
- Structural glazing facade, partly curved

Consultancy Services

- Project Objectives and Brief
- Concept/Schematic Design
- Technical/Construction Design
- Specification/Tender
 Documentation
- Execution Compliance Control

Special Services

- Simulations

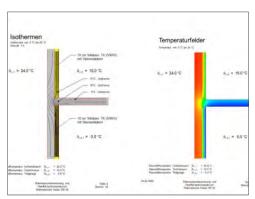
Status

Completed 06/2009

KPMG Headquarters Köbis-Dreieck Berlin



KPMG Headquarters Köbis-Dreieck in Berlin



Thermal Building Physics - heat flow calculation



Controlled, vertical glass lamellas as-built



rotatable vertical lamellas, external sunscreen in open state

Client

INVESTA, HOCHTIEF and Groth Group

Owner • Developer

Köbis Dreieck Berlin-Fonds

Architect

- Nicolas Grimshaw & Partners, London
- Claus Neumann Architekten, Berlin

Project Data

- approx. 27 m building height
- approx. 12,200 m²
 facade surface

Building FunctionOffice

Technical Features

- Unitized curtain wall, integrated maintenance walkway
- External sunshade, controllable vertical glass lamellas
- Stick system facade
- Parallel opening windows, integrated sunscreen
- Atrium skylight

Consultancy Services

- Project Objectives and Brief
- Detailed/Developed Design
- Technical/Construction Design
- Specification/Tender Doc.
- Tender Evaluation
- Design Compliance Control
- Mock-Up Association
- Execution Compliance Control

03/2024

Special Services

- Thermal Building Physics
- Energy Performance Certificates

Status

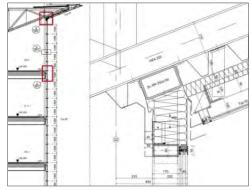
Completed 10/2005

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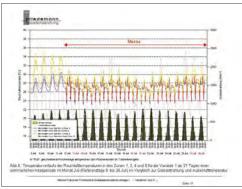
Frankfurt Fair, Hall 11 and Portalhaus Frankfurt



Portal building of the Frankfurt Fair



Typical detailing of the portal building



Excerpts of computer simulation



Glass facade elevation with silk screen printings



Facade elevation of exhibition hall 11 with precast reinforced concrete units

Client

Messe Frankfurt Venue GmbH & Co.KG

Owner • Developer

Messe Frankfurt Venue GmbH & Co.KG

Architect

Hascher Jehle Architektur

Project Data

- approx. 30 m building height
- approx. 73,000 m² facade surface

Building Function

Exhibition Building

Technical Features

- Stick system facade
- Rain screen
- Aluminium cladding
- Silk screen printings
- Lamella facade
- Precast reinforced concrete units

Consultancy Services

- Project Objectives and Brief
- Detailed/Developed Design
- Technical/Construction
 Design
- Design Compliance Control
- Execution Compliance Control

Special Services

- Thermal Building Physics
- Simulations

Status

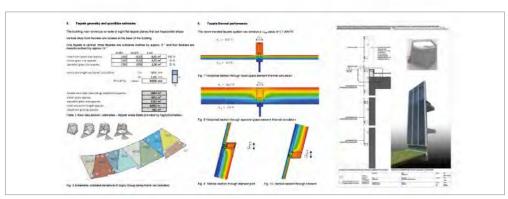
Completed 08/2009

Europe Russia

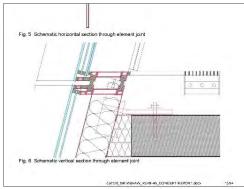
Eight Edges St. Petersburg



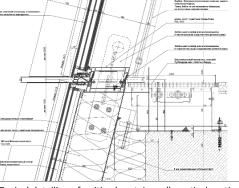
Eight Edges in St. Petersburg, after finalization



Excerpt of the facade concept report



Concept stage, vertical section detail



Typical detailing of unitized curtain wall, vertical section

Client

Leorsa Group

Owner • Developer

Leorsa Group

Architect

GRIMSHAW Architects

Project Data

- approx. 45 m building height

Bulding Function

Office

Technical Features

- Unitized curtain wall
- Stick system facade
- Point-fixed glass lamella (service floor)

Consultancy Services

- Project Objectives and Brief
- Concept/Schematic Design
- Detailed/Developed Design
- Technical/Construction
 Design
- Specification/Tender Documentation
- Tender Evaluation
- Design Compliance Control
- Execution Compliance Control

Special Services

- Thermal Building Physics
- Maintenance, Cleaning, Facade Access, BMU

Status

Completed in 2014

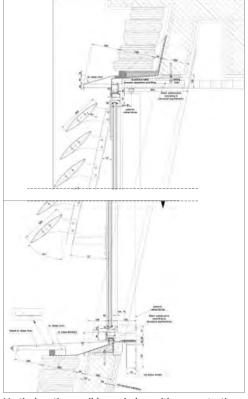
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Africa Ethiopia

Julius Nyerere Peace & Security Building of the African Union, Addis Ababa



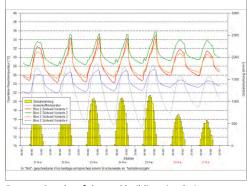
Architectural model of the Peace & Security Building



Vertical sections – ribbon window with sun protection top and bottom detail



Facade elevation - main facade



Excerpt: Results of thermal building simulation

Client

Hascher Jehle Architektur

Owner • Developer

Deutsche Gesellschaft für Technische Zusammenarbeit GmbH on behalf of the German Federal Foreign Office

Architect

Hascher Jehle Architektur

Project Data

- ca. 25 m building height
- ca. 4.500 m² facade surface

Building FunctionOffice

Technical Features

- Earthquake resistant
- Rain screen, natural stone masonry
- Ribbon windows
- External sunshades
- Stick system facade

Consultancy Services

- Project Objectives and Brief
- Concept/Schematic Design
- Detailed/Developed Design
- Technical/Construction
 Design

Special Services

- Thermal Building Physics
- Simulations

Status

Completed 10/2016

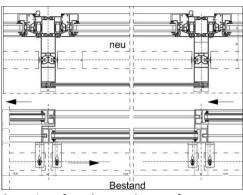
Refurbishment & Extension | Kudamm N° 195 Berlin



The extension building at Kudamm $\mbox{N}^{\circ}\mbox{195}$, view from the Kurfürstendamm



Thermal building physics - zoning



Comparison of actual state and concept for refurbishment, horizontal details



Facade elevation of the extension building



Facade detail after refurbishment

Client

NORDBORN I S.a.r.l.

Owner

NORDBORN I S.a.r.l.

Developer

FREO Investment Management S.a.r.l

Architect

Stauber Associates project-services GmbH

Project Data

- approx. 30 m height extension building
- approx. 45 m height existing building
- approx. 12,500 m²
 facade surface

Building Function

Office, Residential, Retail

Technical Features

- Natural stone facade with ribbon windows (existing building)
- Stick system facade (extension building)

Consultancy Services

- Project Objectives and Brief
- Refurbishment
- Concept/Schematic Design
- Detailed/Developed Design
- Technical/Construction
 Design
- Specification/Tender
 Documentation
- Tender Evaluation

Special Services

- Thermal Building Physics
- Building Acoustics
- Energy Performance Certificates

Status

Completed 02/2014

Refurbishment | Lindner Hotel am Ku'Damm Berlin



Linder Hotel at the Kurfürstendamm



Facade detail



Stick system facade on the first levels



Excerpt from heat flow calculation



Acoustic windows in historical appearance

Client

GEBAU Technik GmbH

Owner • Developer

DIFA Deutsche Immobilien Fonds AG

Architect

Bellmann & Böhm Architekten

Project Data

- approx. 22 m building height
- approx. 4,000 m²
 heritage-protected facade

Building Function

Hotel

Technical Features

- Sound insulation windows in historical appearance
- Integration of existing natural stone matching spandrels
- Colour uniformity with reduced reflection values for sun protection and thermal insulation glass
- Stick system facade

Consultancy Services

- Project Objectives and Brief
- Refurbishment
- Concept/Schematic Design
- Technical/Construction Design
- Specification/Tender
 Documentation
- Execution Compliance Control

Special Services

Thermal Building Physics

Status

Completed 04/2004



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