Finding new concepts for Building Integrated Photovoltaics

EuroSun 2004

Käthe Hermstad, m.arch, SINTEF Civil and Environmental Engineering, department of Architecture and Building Technology

SmartBuild

Research, education and industrial development

- Six-year strategic research program

- 30 researchers full time + contributions by several more

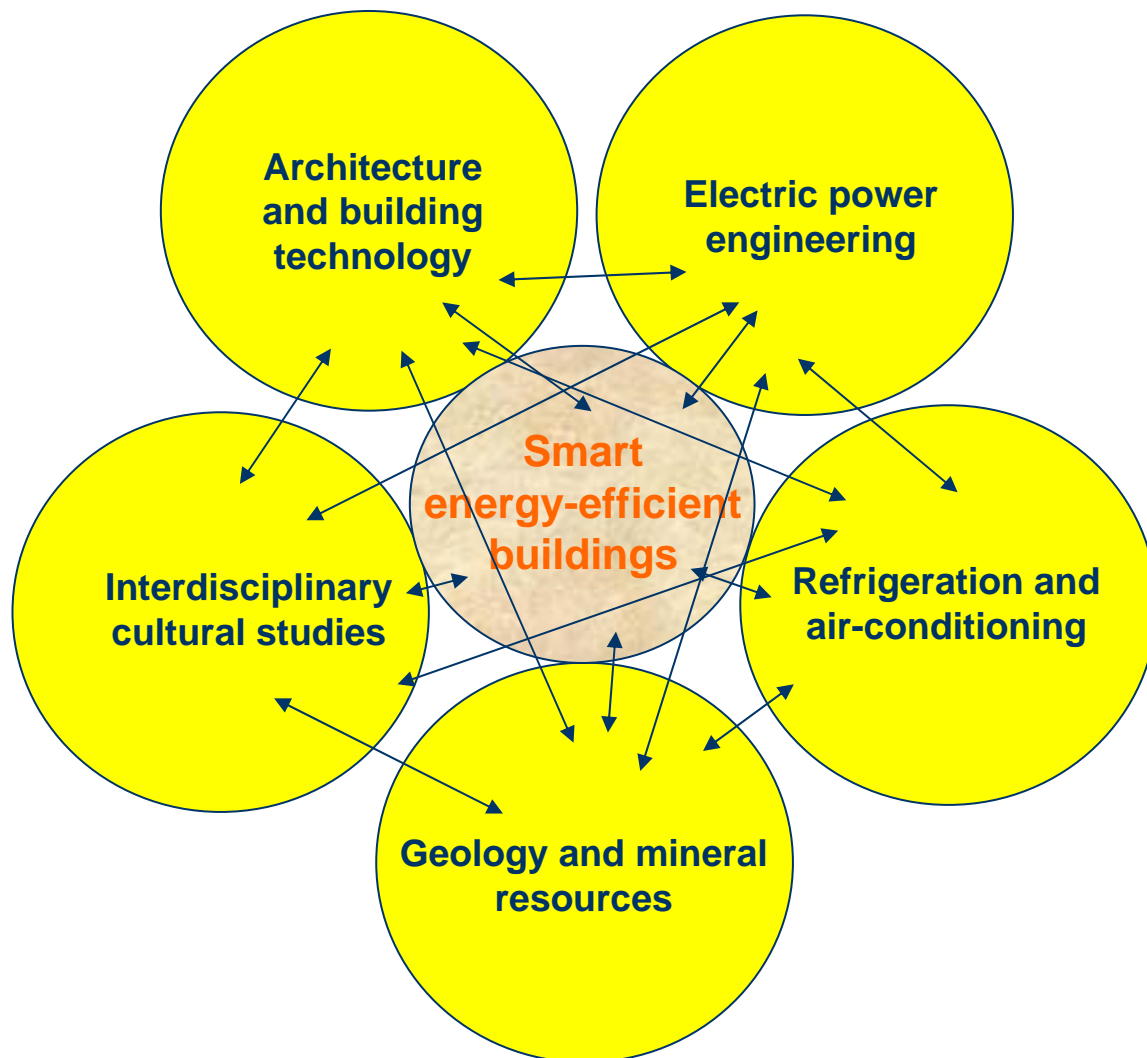- A number of PhD's and post. doc-degrees.

NTNU SINTEF Industrial partners

The project aim
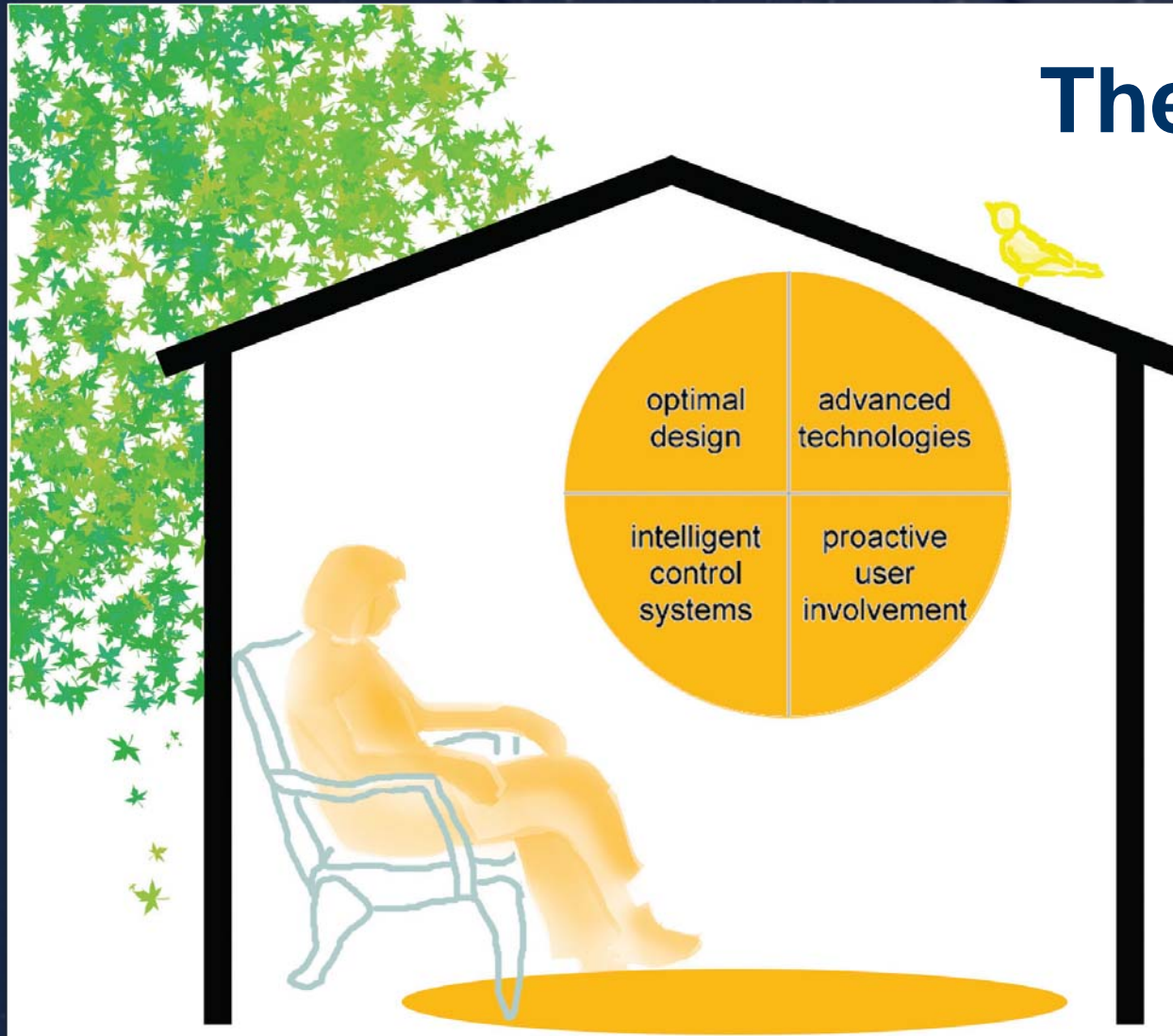
New knowledge

Integrated solutions

Environmentally improved building technologies

User consciousness

optimal design | advanced technologies

intelligent control systems | proactive user involvement

The character of the task

- Complex

Architecture and building technology

Electric power engineering

Smart energy-efficient buildings

Interdisciplinary cultural studies

Refrigeration and air-conditioning

Geology and mineral resources

The character of the task

- Complex

- Multi-disciplinary

The character of the task

- Complex

- Multi-disciplinary

- Innovative - 2020

Building focus: Large & office

- Large budgets
  - Construction
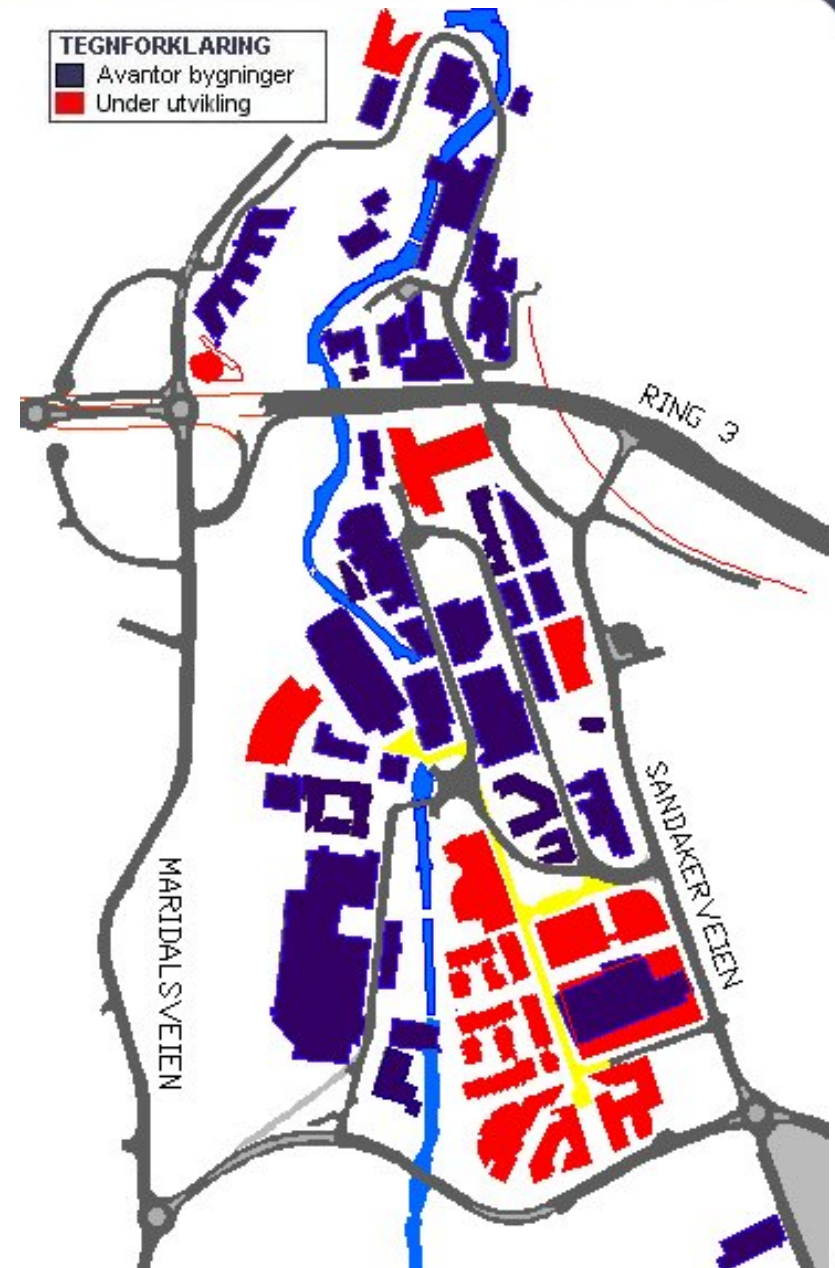 - Service and maintenance

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- Complex structures
  - Requires a holistic approach
  - Effective components
  - System security

Building focus: Large & office

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- High impact
  - Higher interest from architects
  - Transferability of knowledge
  - Many users affected

Office trends

- Ownership & service
    - Outsourcing
    - Nomadic companies

TEGNFORKLARING
Avantor bygninger
Under utvikling

RING 3

SANDAKERVEIEN

MARIDALSVEIEN

Office trends

- Ownership & service
  - Outsourcing
  - Nomadic companies

- New materials and technology
  - Materials & construction
  - Machine & nature

Office trends

- Ownership & service
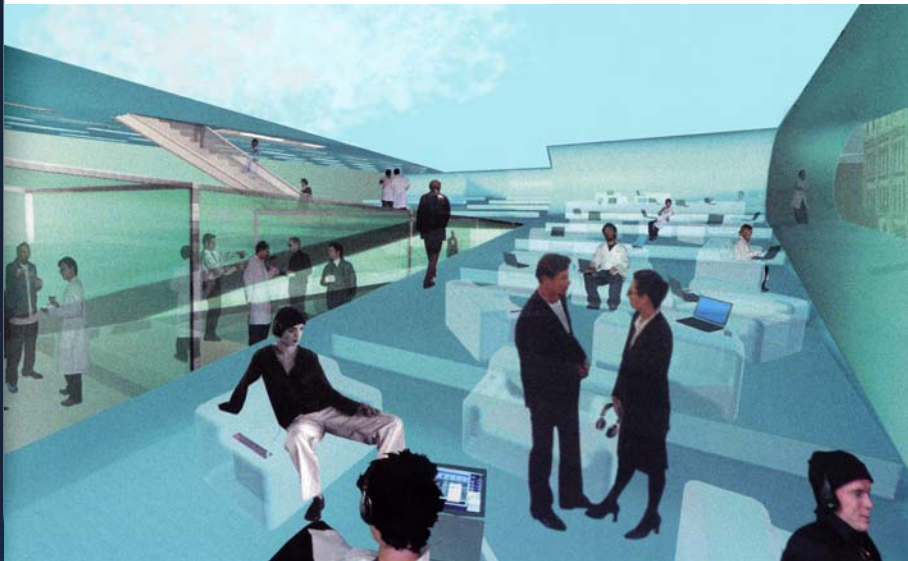 - Outsourcing
  - Nomadic companies

- New materials and technology
  - Materials & construction
  - Machine & nature

- New interpretations of program and the organisation of work
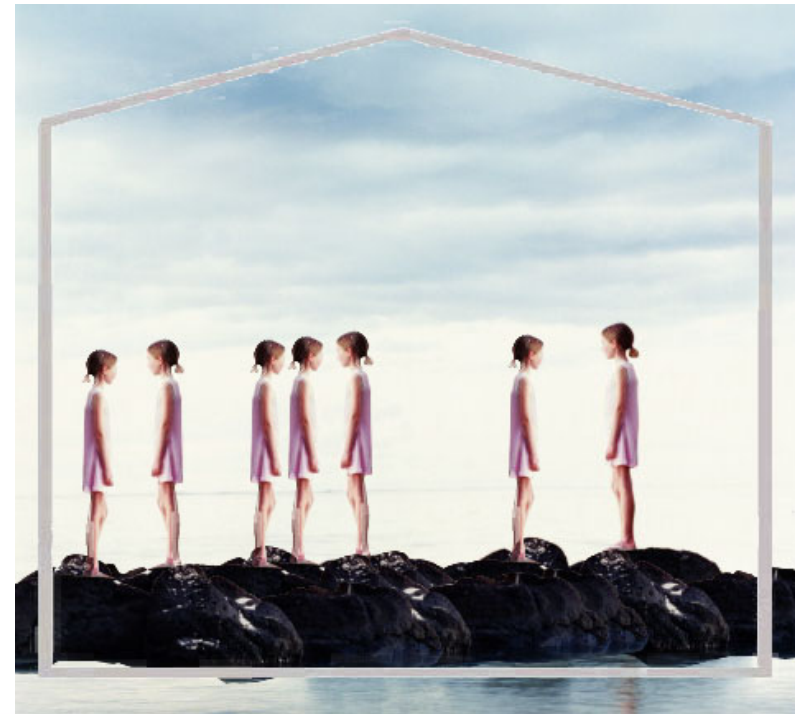 - Image & company
  - Work & social
  - Equipment & network
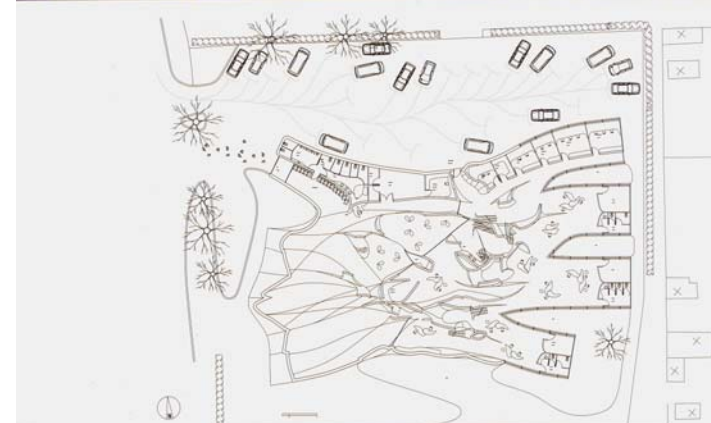
Office at a glance

- Business can take place everywhere

Office at a glance

- Business can take place everywhere

- Employees need to interact

# Main PV barriers for architects

- Technically complex but
  - 2-dimentional
  - static
  - numerous similar products

- Initial competence is expensive
  - Introduced as an engineer application
  - introduced late in the design process

- Conceptually rigid
  - Expensive, but often hidden away

- Associations

- The architect must sell it

Approach for success

- Work with PV from the language of architecture
    - The system requirements are also design tools
    - Investigation of aesthetical potential
    - Early integration with conceptual development

- Material and technology development and re-thinking
    - Broad product range
    - Broad conceptual possibilities

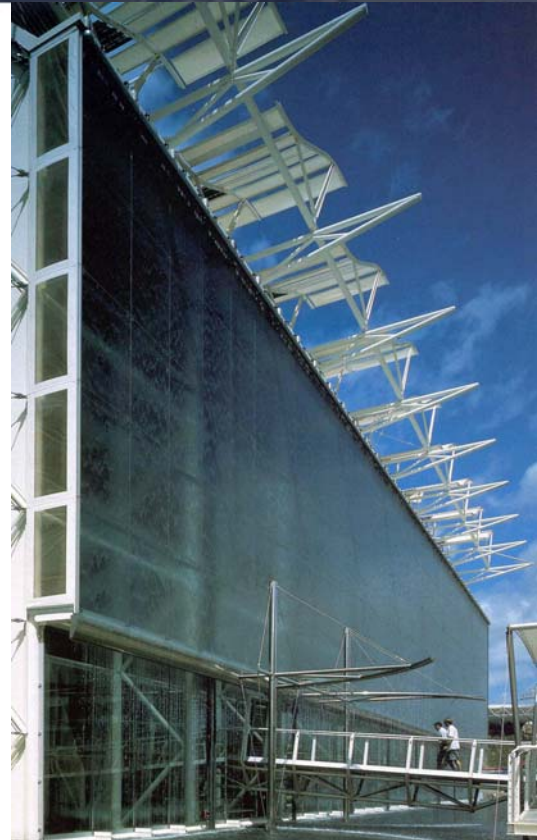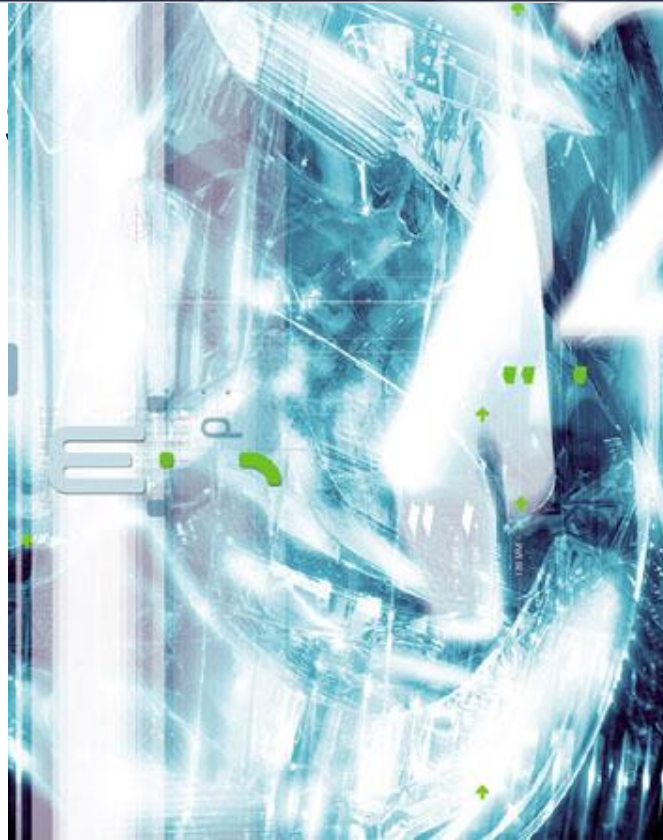- System development
    - Compatible products/systems
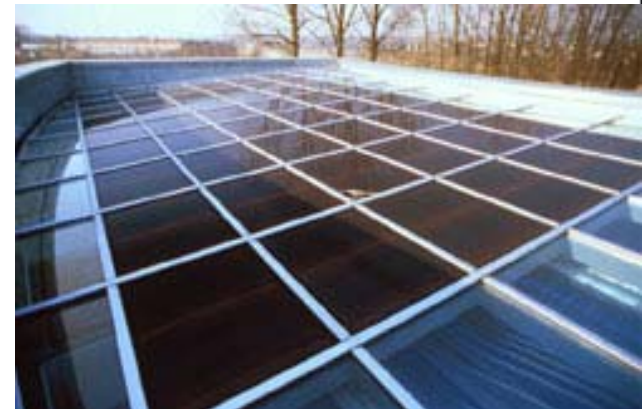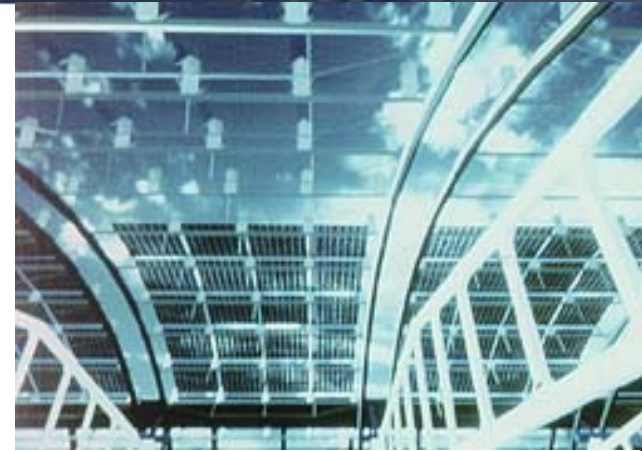
Testing ground Pynten
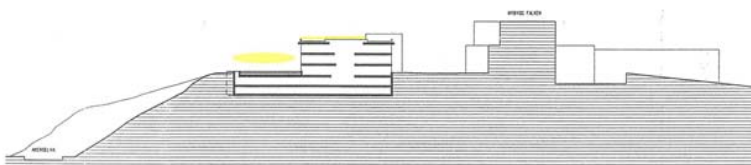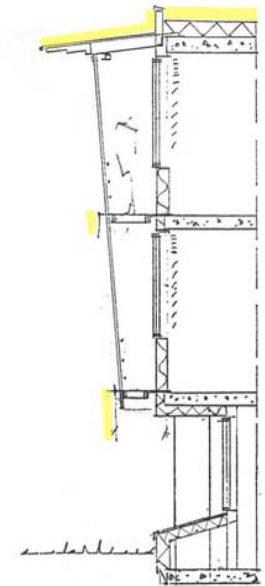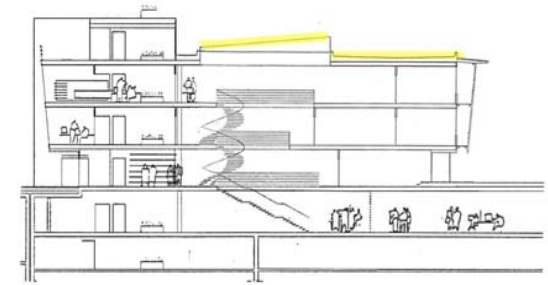
Investigation

- Light
    - Shadowpatterns
    - Colours
    - Transparency
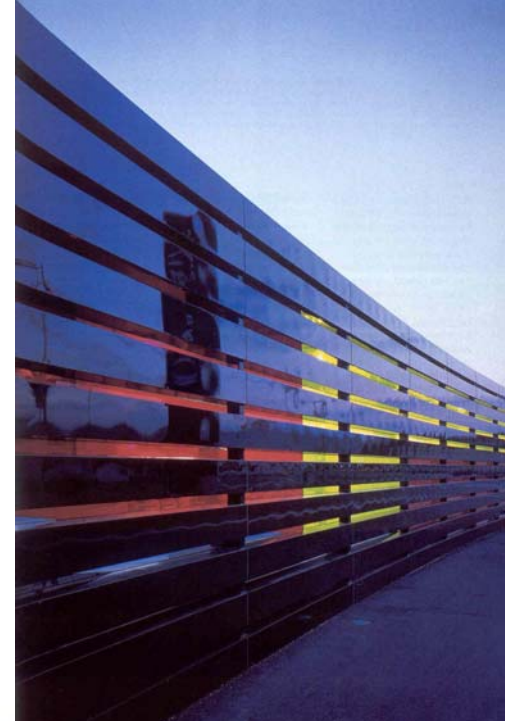   - Effects

Investigations

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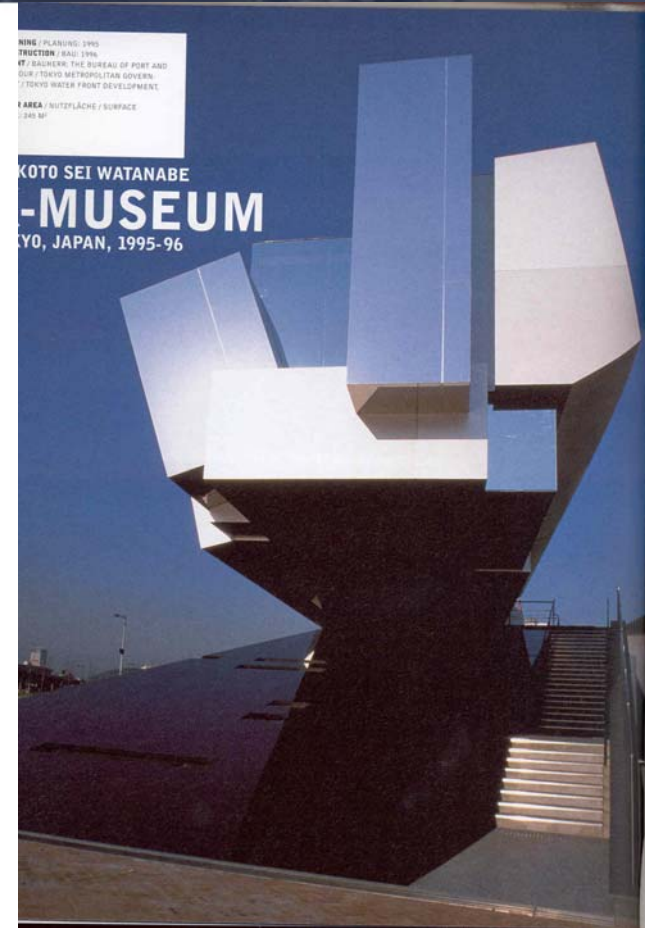
Investigations

- Light
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- Materials
  - Weight
  - Surfaces
  - Dimensions

- Image
  - Materials and detailing
  - System design
  - Placement

We want to improve PV as a tool for making beautiful architecture.

Thank you for your attention!