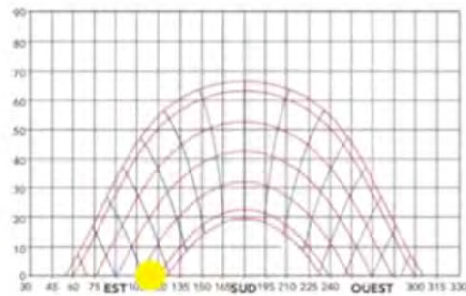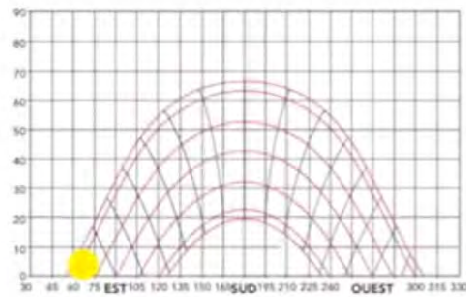# Using an artificial sun
shadow analysis with heliodons

winter
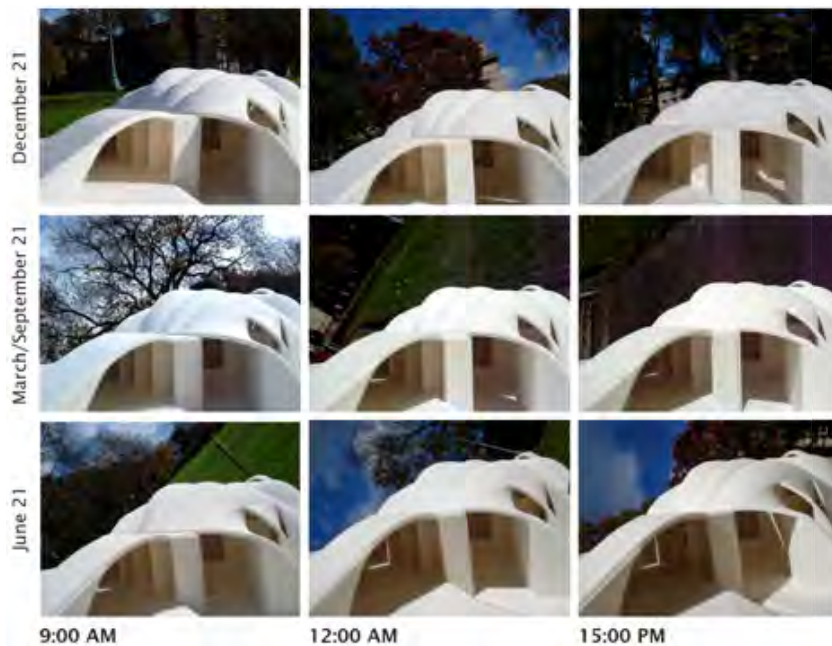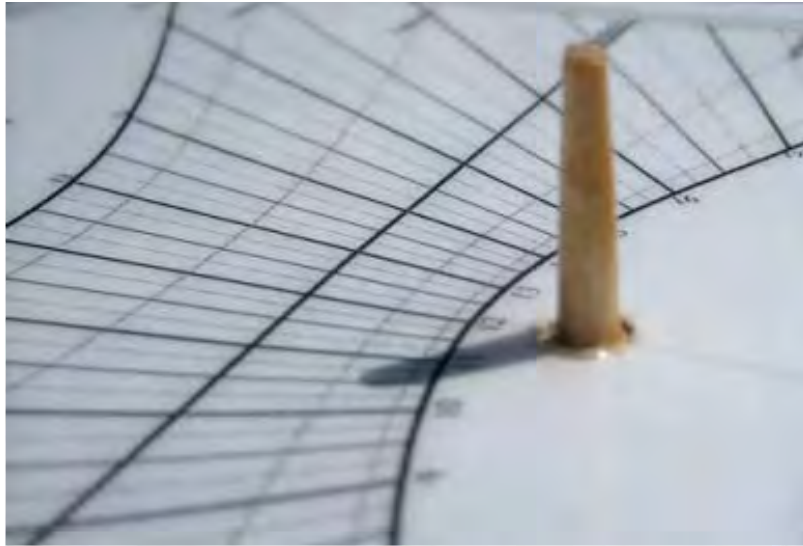
summer

Using the real sun

shadow analysis with sun pegs (gnomons)

December 21

March/September 21

June 21

9:00 AM   12:00 AM   15:00 PM

Designing with daylight (sun+sky)

basic principles

- **orientation** as a driver for façade design

ENE Facade

WSW Facade

Carpenter Center, Cambridge MA (by Le Corbusier)

Designing with daylight (sun+sky)

basic principles

- **orientation** as a driver for façade design
- **harvesting** daylight (collect-transport-distribute) from access to sky
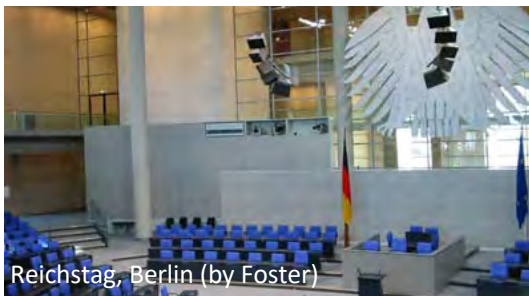
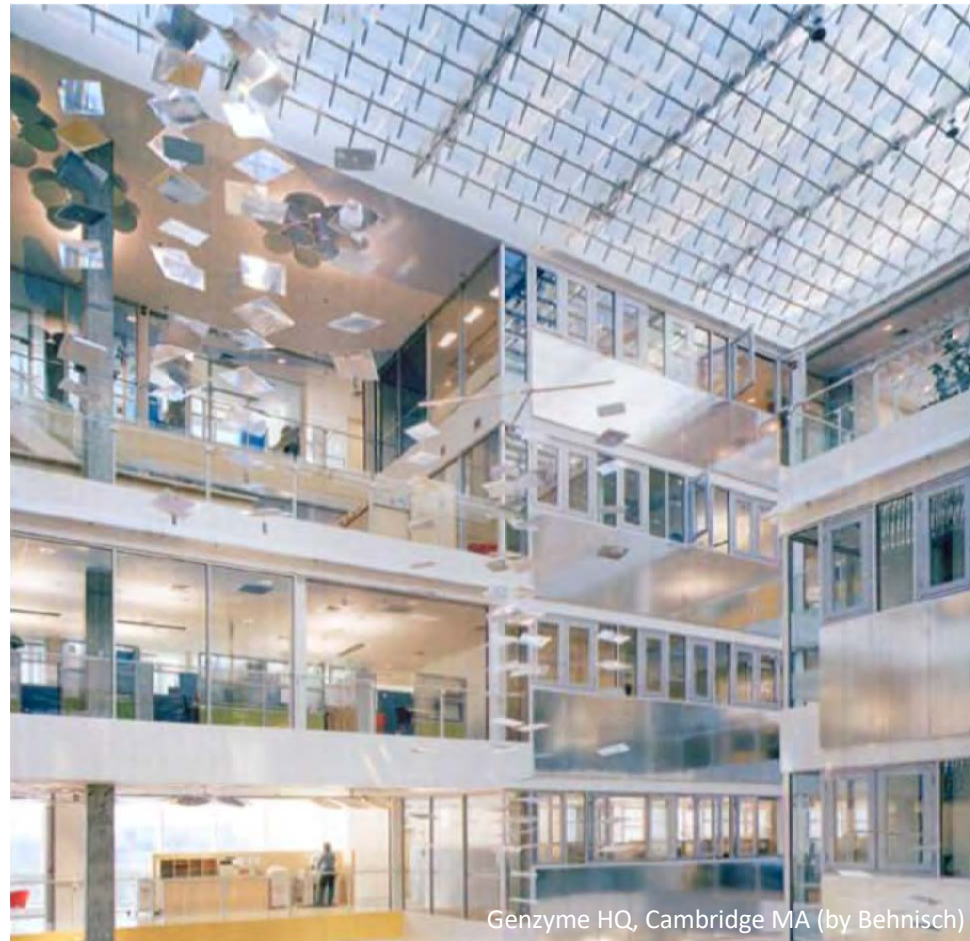Reichstag, Berlin (by Foster)

Genzyme HQ, Cambridge MA (by Behnisch)
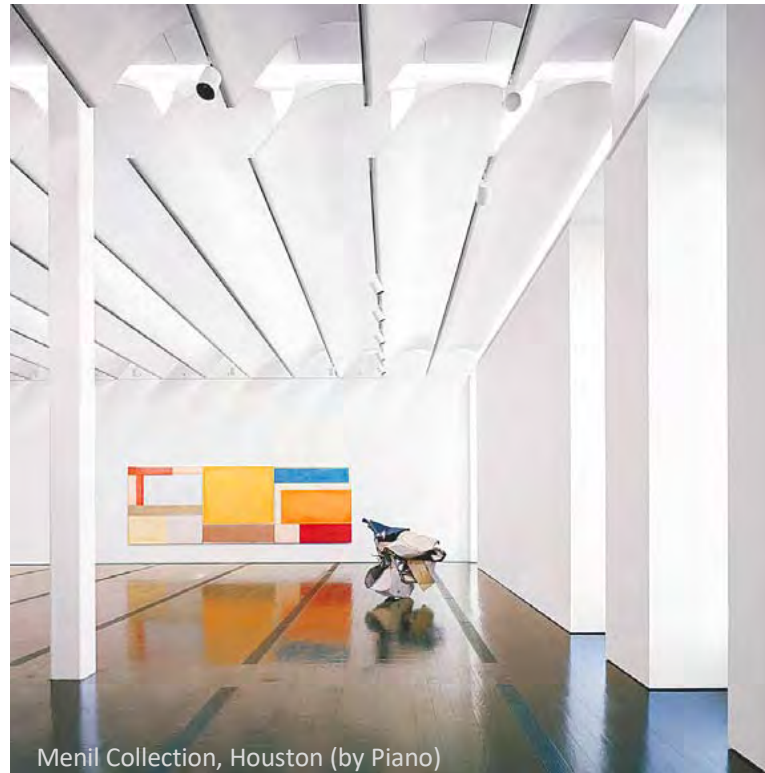
Designing with daylight (sun+sky)

basic principles

- **orientation** as a driver for façade design
- **harvesting** daylight (collect-transport-distribute) from access to sky
- **ambient** vs. **task** illumination (with **glare** control)

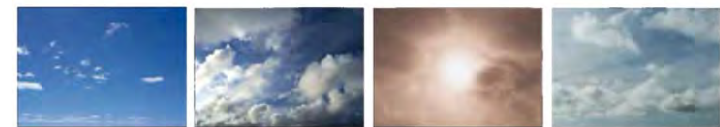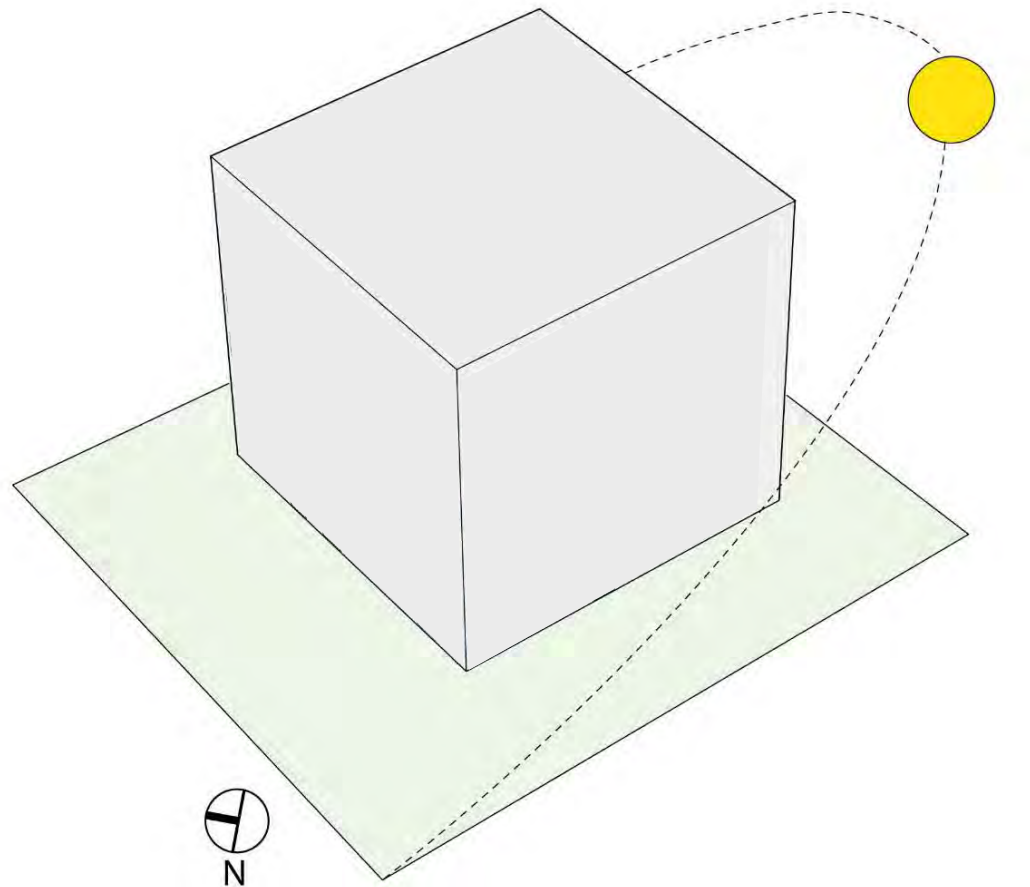rule of thumb : **depth** of penetration = window **height x 2**
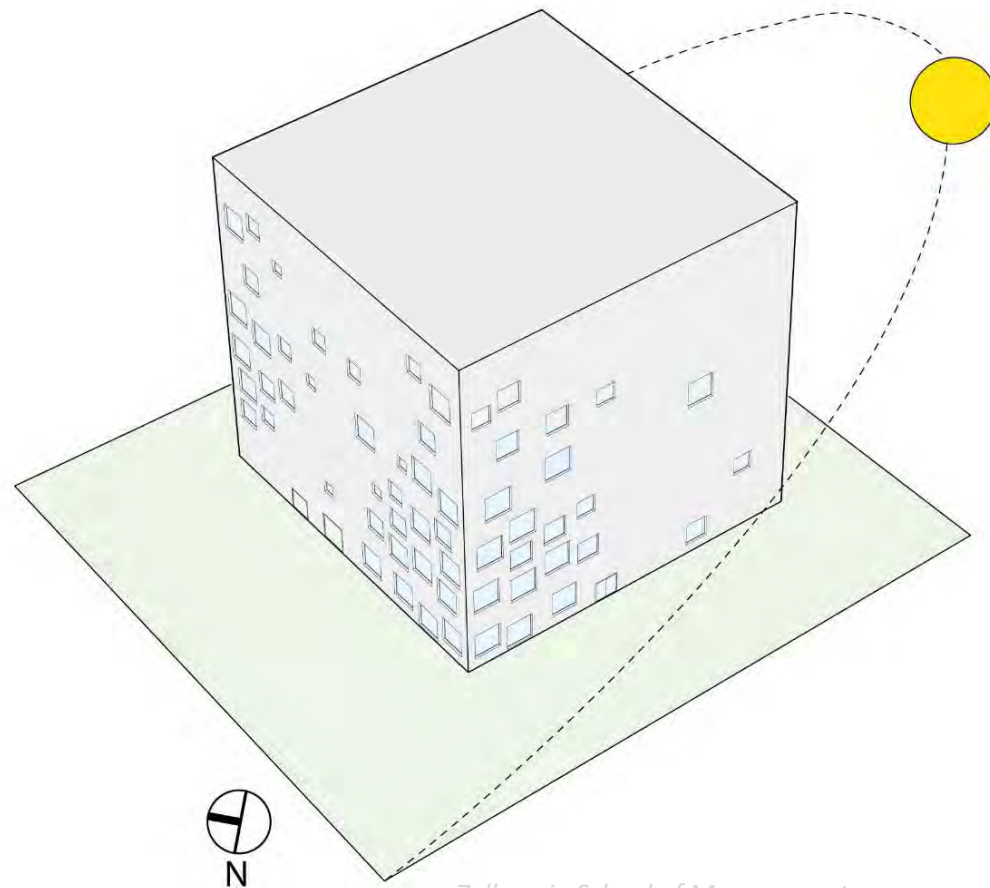

Exeter Library, New Hampshire (by Kahn)

Menil Collection, Houston (by Piano)

outside

sun course and weather patterns
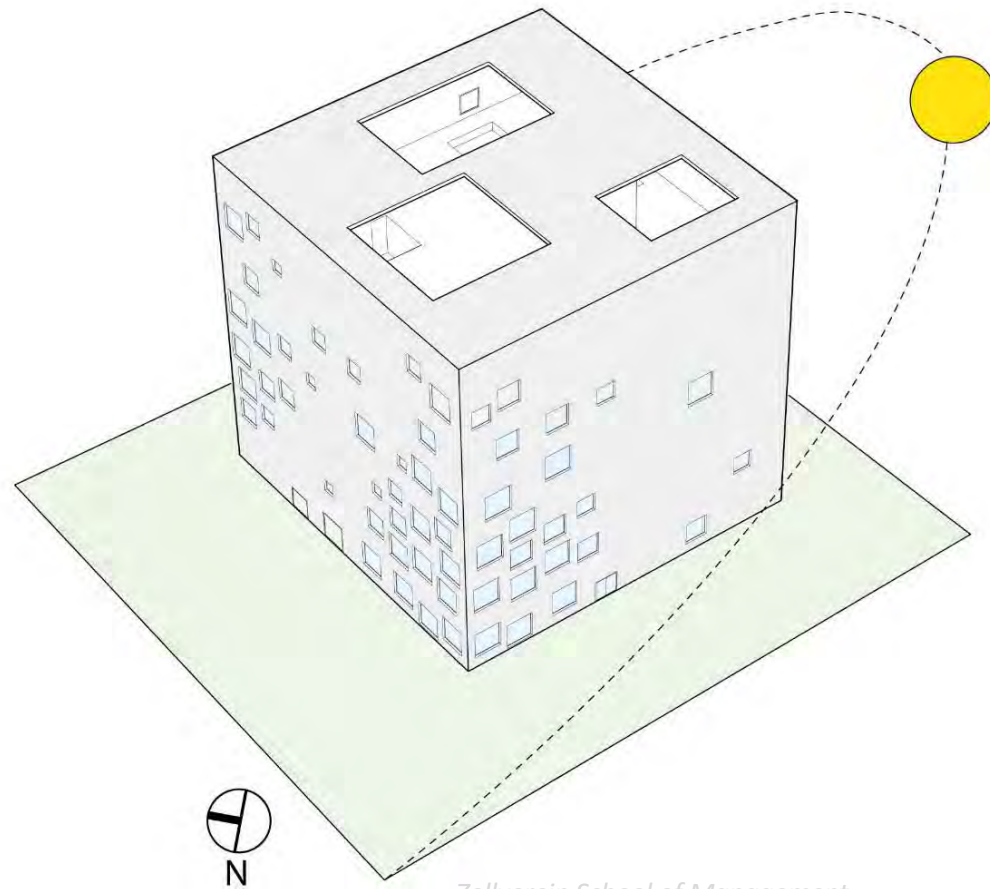
EPFL

building permeability

Zollverein School of Management
Essen, Germany by SANAA

cold | temperate

hot-arid | warm-humid

climate-driven building envelope

EPFL

building dynamics
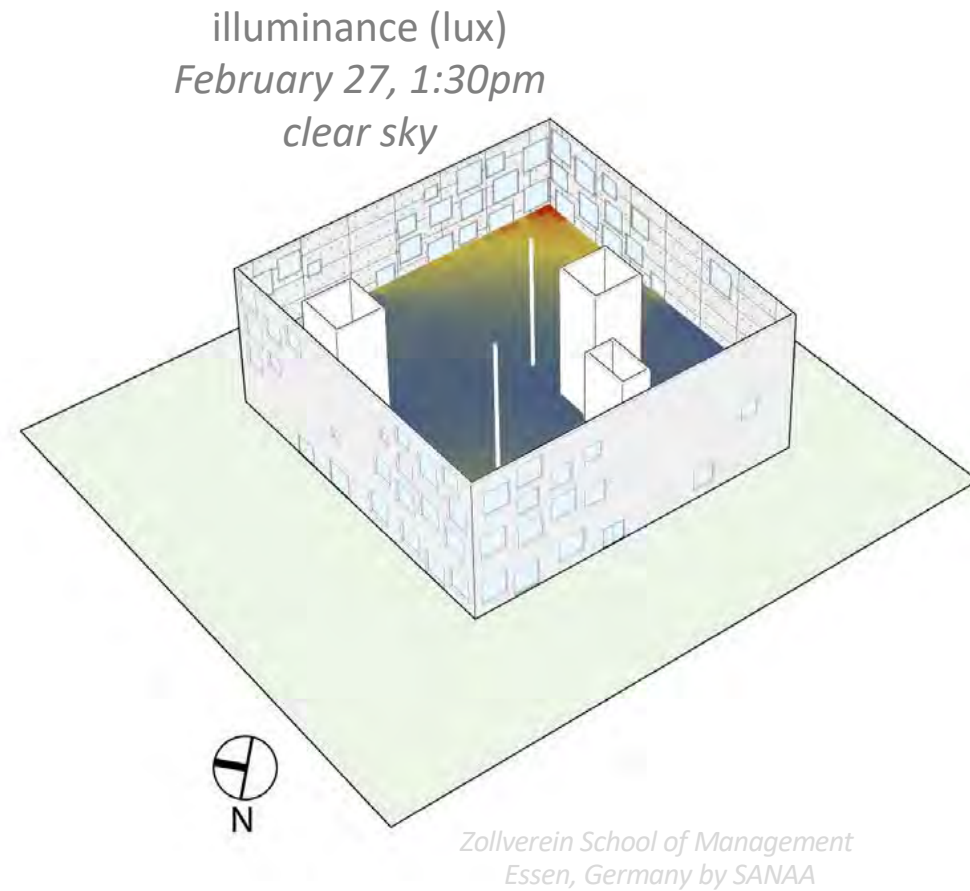

Zollverein School of Management
Essen, Germany by SANAA

OEKK building, Landquart GR (Zumthor, Bearth&Deplazes)

seasonal management
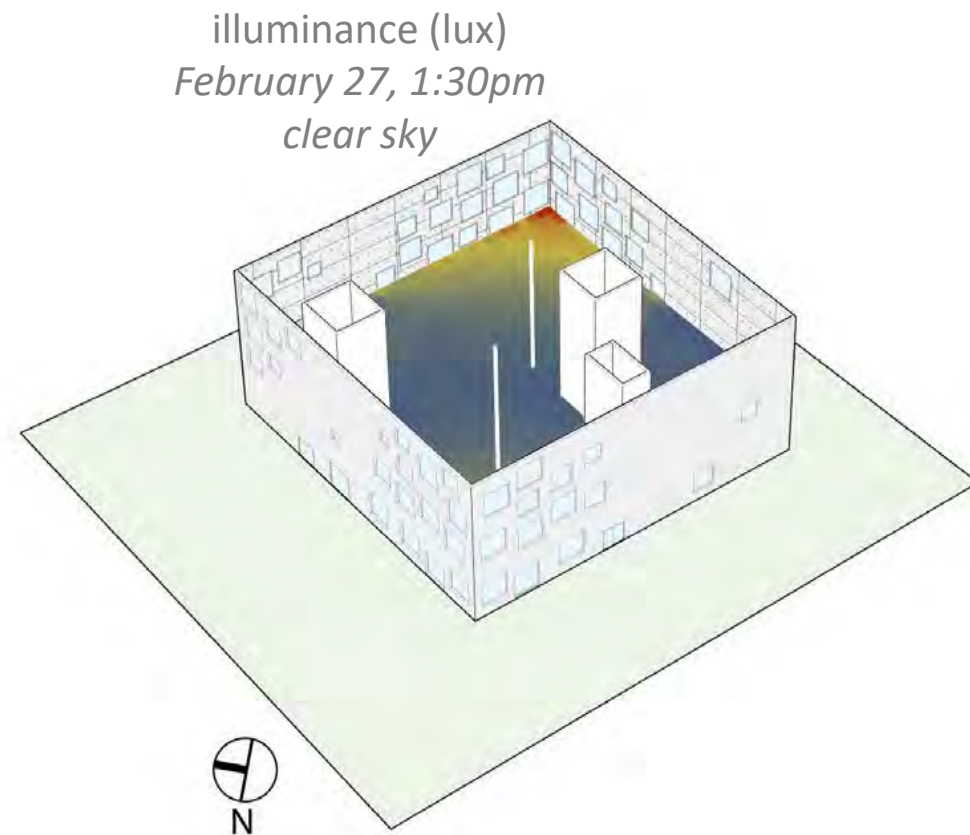
EPFL

«measuring» daylight

Task illumination metrics

illuminance (lux)
February 27, 1:30pm
clear sky

Zollverein School of Management
Essen, Germany by SANAA

instantaneous
- *illuminance (lux)*

EPFL

«measuring» daylight

illuminance (lux)
February 27, 1:30pm
clear sky

Task illumination metrics

instantaneous
- *illuminance (lux)*

EPFL