



# Daylighting

## Introduction

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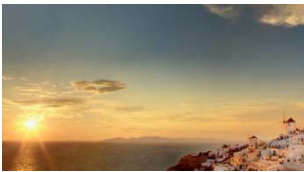
Dpt. of Building Energetics and Services  
K.231.

[www.egt.bme.hu/filetoth](http://www.egt.bme.hu/filetoth)

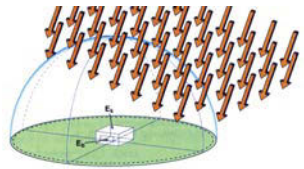
## Daylighting = Natural illumination



Daylighting  
characteristics



Light sources and  
luminaires



Designing for daylight

## Daylighting = Natural illumination



Daylighting  
characteristics

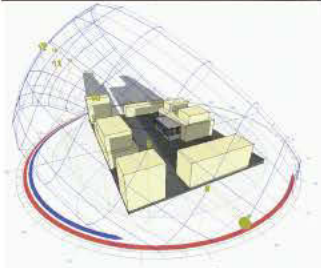
## Artificial Lighting



### Design:

- Artificial lighting design by the consulting engineer (not by the architectural designer)
- Artificial lighting design is at the tender or construction documentation stage

## Daylighting



### Design:

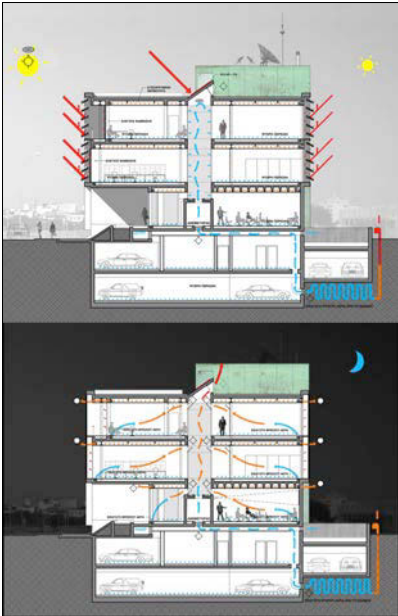
- Designed by the architect
- Daylighting design is created at the conceptual or early design stages, as a "by-product" of the architectural design:
  - building volume
  - orientation
  - facades/openings

## Artificial Lighting

### Utilization

- Primary goal is to provide adequate illumination for the interiors - according to room function and illumination standards
- It has an effect on the total energy consumption of the building as well





## Daylighting

### Utilization:

- Provides generic illumination for the interiors
- Building constructional, structural, building energetics, passive-solar effects must also be carefully studied

## Artificial Lighting



### Energy consumption

- Electric energy (fossil or renewable) is essential for artificial illumination

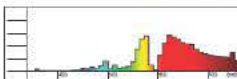
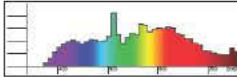
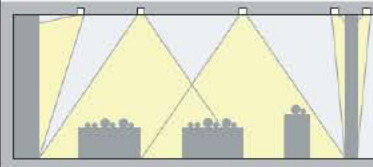
## Daylighting



### Energy consumption

- Uses only renewable energy!

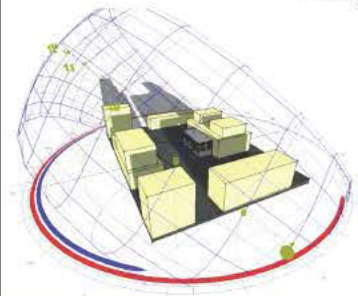
## Artificial Lighting



### Characteristics of the provided illumination:

- constant illumination values can be considered, defined in manufacturers' catalogues
- illumination values and characteristics defined by standards

## Daylighting



The quantity of the provided daylight varies throughout the day and the year - great illumination differences

The quality of the daylight is always excellent - regardless of the part of the day or the year



## Artificial lighting



### The geometry of the interior:

luminaires are located within the interior spaces, rooms

the size of the luminaires are much smaller than that of the rooms

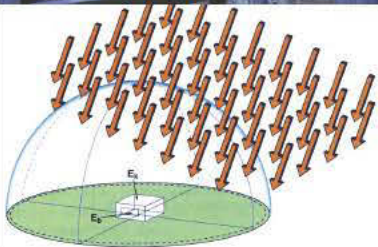


## Daylighting



### The geometry of the interior:

the daylight arrives from the exterior (sun, sky...)



the size of the external sky hemisphere is much greater than that of the interior space

## Daylighting

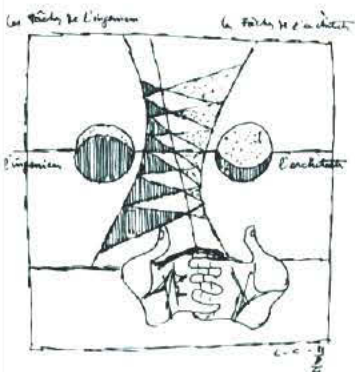


### Openings provide connection with the exterior space

**Visual connection** (windows, skylights, etc.)

**Daylight or natural light** is necessary for a healthy interior, living space (psychological, biological relevance)

## Artificial lighting and daylighting



- The two **can't be separated** in the illuminated interior space
- Daylighting and artificial lighting must be designed and handled to be able to create a **united illumination experience!**



## Daylighting and artificial lighting design

- an “appropriate” interior space must be created - by the architect - that also provides great daylighting possibilities
- the artificial illumination system must be adjusted to the interior space and function by the illumination engineers



Juha Leiviskä: Myyrmäki church - Nordic light



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