

Daylight usage of typical Swiss buildings

Project supervisor: Dr. Jan Wienold – LIPID | EPFL

Context

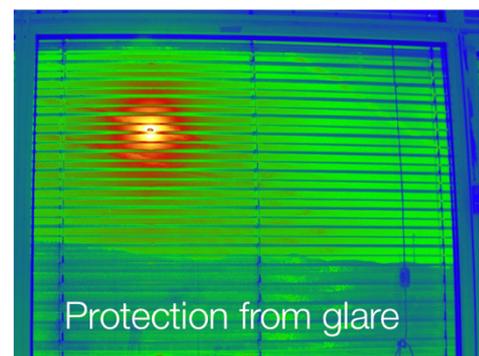
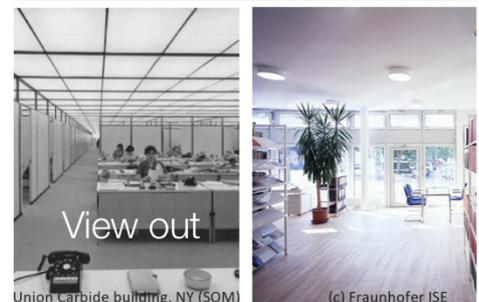
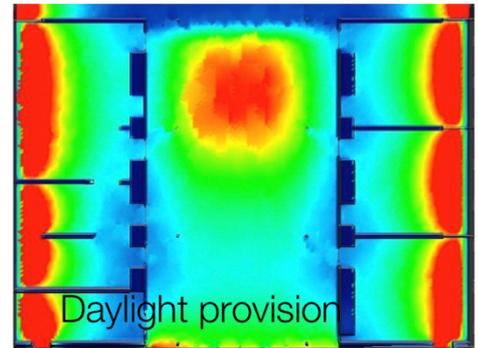
The importance of daylighting in our daily lives and in particular in the built environment has become unquestionable nowadays, made evident not only by energy conservation priorities placed at the forefront since the seventies and by the legacy of successful buildings, but also by well-being aspects, ranging from the need to connect to the outside through views to likely effects on productivity, work satisfaction and performance.

So far in the Swiss building practice, the use of daylighting plays a rather minor role since densification and energy driven regulations are dominating and are setting boundaries, which are often undermining the usage of daylight.

This situation will change now since a new European daylight standard (EN17037¹, “daylight in buildings”) was published in December 2018 and will be implemented in Switzerland latest until June 2019.

This new standard *“encourages building designers to assess and ensure successfully daylit spaces. It also allows building designers and developers to target ambitions with respect to daylighting, as well as addressing other issues related to daylight design, such as view out, protection against glare, and exposure to sunlight.”*

The standard defines for each of the four criteria (daylight availability, view out, exposure to sunlight and protection against glare) calculation methods and three different levels of recommendation (“minimum”, “medium” and “high”).



Objectives and method

The goal of this semester project is to evaluate the daylight performance of typical Swiss buildings. This evaluation should answer the question to what extent current design practice in Switzerland addresses daylighting and to make proposals to improve it.

1. In a first stage, typical buildings will be selected from a pool of buildings available. The selection should include different typologies and usages (e.g. residential, offices, health care, rural, urban...).
2. For each of these buildings a Rhino model will be prepared to enable daylight simulations.
3. In the next phase, daylight availability across the usage space, access to direct sunlight, view to exterior and the presence of glare will be evaluated according to the calculation methods described in the standard.
4. The achieved results for each type will be compared to the three levels of recommendation
5. For cases “failing” some criteria, possible improvements should be discussed and, if time allows, calculated as well (e.g. increase of window size by x %).
6. Impact on current design practice should be discussed.

Skills, equipment and tools involved

The project requires to model and/or adjust existing the typical buildings in 3D using Rhino and to simulate the daylight performance with the RHINO plugin DIVA.

Previous experience with any of these would be an advantage but is not mandatory. The supervisors will provide initial tutorials to familiarize with the tools as well as support during the semester.

This project can be carried out by more than one student.

Reference

1. European Committee for Standardization CEN. Standard EN17037:2019, Daylight in buildings.