

Dragvoll University

Trondheim, Norway

63,6°N, 10°E

predominantly cloudy

university building

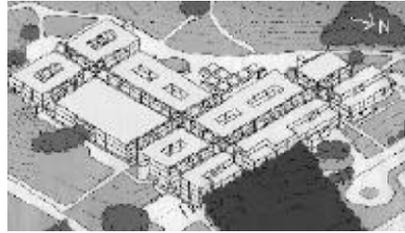
rooms are oriented to an interior glazed street

building

The university center at Dragvoll is composed of several office and classroom buildings that are connected by a network of glass covered "streets". These streets measure 8,4 m in width and refer to the grid of the old city of Trondheim. Common functions such as auditoria, workshops etc. are placed on the street level, while offices occupy the upper floors. Built in 1970, the building was not designed with energy-efficiency in mind. The "streets", that turn out to act as buffer zones, were only meant to provide attractive spaces. Consequently only half of the rooms face such interior streets; the rest remains exposed to exterior courtyards or the surrounding landscape.

daylight strategy

The roof covering the streets consists of double clear glazing but is not equipped with further daylighting systems. The window area of the facade is smallest on the top floor, increasing towards the ground floor. This scheme allows light to reflect off the opaque white-painted areas on the upper part of the facade, down to the lower rooms and the street itself. The daylight level in the recorded seminar room on the ground floor remains considerably low however, due to the additional obstructions by a nearby staircase and an information panel. An exterior awning is attached to the facade as well. Monitoring the daylight performance at the Dragvoll University showed, that the glazed streets have a very high amenity value. While the daylight strategy in the adjacent offices performs well in the upper stories, the rooms on street level still appear rather dark.



The Dragvoll University Center is situated on flat farm land outside the city.



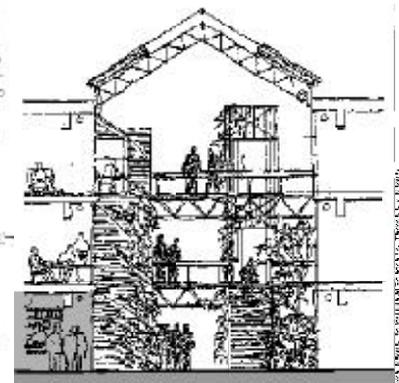
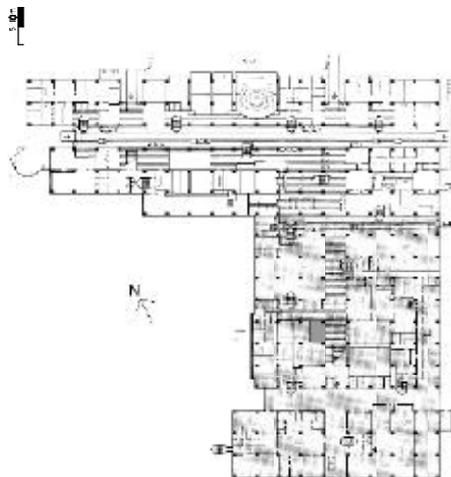
View of glass covered streets of the University center. The seminar room which has been recorded is on the left.



Glass covered streets: operable windows in the roof permit natural ventilation of the streets.



Street facade equipped with shading systems. The information panel obstructs the window.



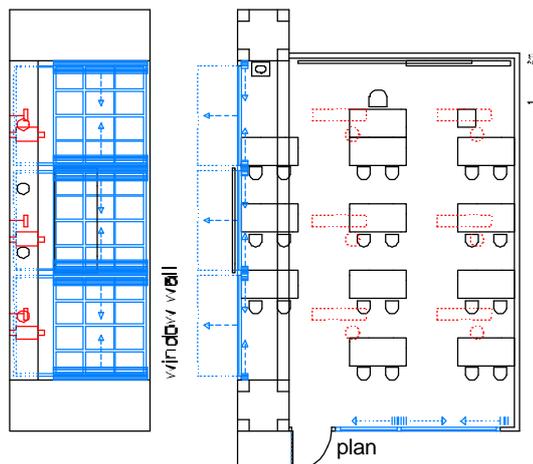
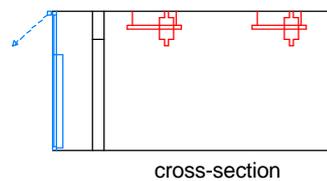
Plan and cross-section: The cross-section shows the concept of the glazed streets which are harmoniously integrated in the plan.



Seminar room adjacent to the glazed street; translucent glass diffuses daylight to the rear part of the room and increases privacy.



View of the window wall; translucent glazing causes glare when it turns too bright.



building data

- size 45 700 m²
- number of stories 5, 3 adjoining the interior glazed street
- architect Henning Larsen
Per Knudsen
- daylight consultant Øyvind Aschehoug
Mogens Balslev
- year of completion 1978, extension 1993

of office room

- daylight strategy passive side lighting,
linear atria
- dimensions (depth/width/height) 5,8 m / 8,0 m / 3,0 m
- room area 46,4 m²
- floor beige / grey, 49%
- wall white, 73%
- ceiling white, 73%
- teacher's desk timber, pine colored,
36%
- blackboard coating, dark green,
9%
- facade, lower window translucent glazing
- facade, upper window clear glazing
- lamp types fluorescent lamps
- installed power density 7,7 W/m²
- control strategy manual switching

| facade | air um facade | | corridor facing window |
|------------------|---------------------|------------------------|------------------------|
| | air um facade | corridor facing window | |
| orientation | 115° | 25° | |
| glazed area | 17,9 m ² | 9,7 m ² | |
| opening index | 75% | 56% | |
| daylighting | ● | - | |
| view outside | ● | ● | |
| ventilation | □ | - | |
| operable | □ | - | |
| shading | ● | - | |
| redirection | ● | - | |
| function | translucent glazing | translucent glazing | |
| systems | curtain | awning | translucent glazing |
| sun shading | ● | □ | - |
| glare protection | ● | □ | - |
| redirection | □ | □ | □ |
| inside | ● | □ | □ |
| window pane | □ | □ | □ |
| outside | □ | □ | □ |
| movable | ● | ● | ● |
| fixed | □ | □ | □ |