



the training facility standing on a small mountain overlooking the Lake



the external wall and ceiling made of pre-cast concrete slabs to reduce the use of form work.

Building Type/Use Training institute
(accommodate 70 guests)
Country Japan
Client Toyota Motor Corporation
Architect NIKKEN SEKKEI Ltd
Occupation 2005.02

Building Performance

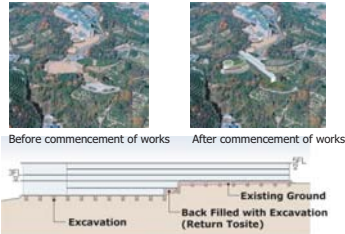
- Distance from public transport stop in **about 1000m**.
- Predicted or actual km traveled per year to and from the building by all occupants whose primary mode of transport is a motor car; **700,000km**
- Development density as ratio of density of surrounding uses;
- Predicted or actual kWh/m2 per year primary operating energy for all operating end uses; **1,344 MJ/m2 per year**
- Predicted or actual Kg/m2 per year eCO2 for all operating end uses; **78Kg-CO2/m2 per year eCO2**
- Predicted or actual L/m2 per year of potable water consumption; **1000L/m2 per year**
- Predicted or actual indoor CO2 concentrations in ppm for typical occupancies under normal operating conditions; **400~600ppm**
- Percent of construction cost spent within the greater urban area; **about 90 ~100%**
- Other performance information of interest that is not included above or in the performance assessment
- result; **Life cycle CO2 emission is 105kg-CO2/ m2 per year and the reduction rate of it is 21%.**

Architectural Features

This training facility is the center of the Toyota Institute, and educational organization

"Using the existing topography"

The building was situated with the aim of leaving all of the existing trees standing. The T-shaped building layout conforms to the topography of the site. To minimize excavations, the height difference within the site was exploited, so that the accommodation block has five floors on the west side and three above ground level on the east.



"Double-skin with roll-screen"

The Double-skin system is an effective passive technique that can decrease solar gain into the building. It was installed in the atrium located in the west façade of this building to realize the best design for thermal comfort and energy-saving.

"Thermal tunnel ,roof planting"

Rooftop planting to landscape and reduce the thermal loads. Thermal load by air change loads Using routed through the pit (thermal tunnel).

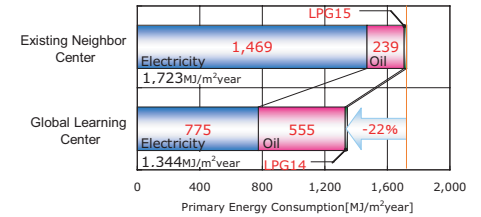
Heating degree-days and cooling degree-days; 1483/476 (18C/24C)
Gross area above ground ;10,300m2
Gross area including below-ground area; 10,300m2
Number of stories; +5
Estimated typical population;10employee+70guests



Highlight of Assessment Results

"Primary energy consumption"

Primary energy consumption is 1,344MJ/m2year and the reduction rate to a existing neighbor center is 22%.
The reduction rate of emission LCCO2 is 21%.

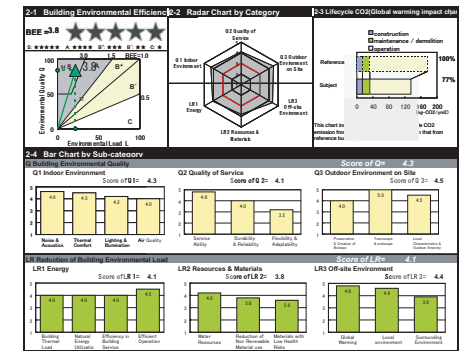


"Solar-Cut effects of the Double-Skin "

Maximum air change rate of natural ventilation the bottom opening up to the top opening is about 20~25[1/h], the reduction ration of total solar heat gain to compared with those of non-natural ventilation is about 25%.



"Assessment result by CASBEE-EB"



Using the existing topography

"Purse harmony with natural environment"

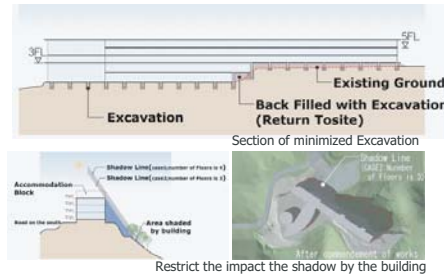
The building was situated with the aim of leaving all of the existing trees standing in the site and using the borrowed scenery of that foliage to create a rich interior environment. The T-shaped building layout conforms to the topography of the site.



Before commencement of works After commencement of works

"Minimize Excavations"

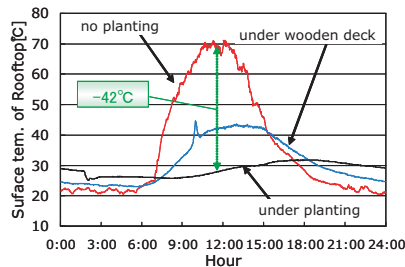
The site was an irregularly-shaped open space, divided between the west side, at much the same height as the road in front, and a rise on the east side, 6m higher. To minimize excavations, the height difference within the site was exploited, so that the accommodation block has five floors on the west side and three above ground level on the east.



Rooftop feature to reduce thermal load

"Roof Planting and Roof Wooden deck"

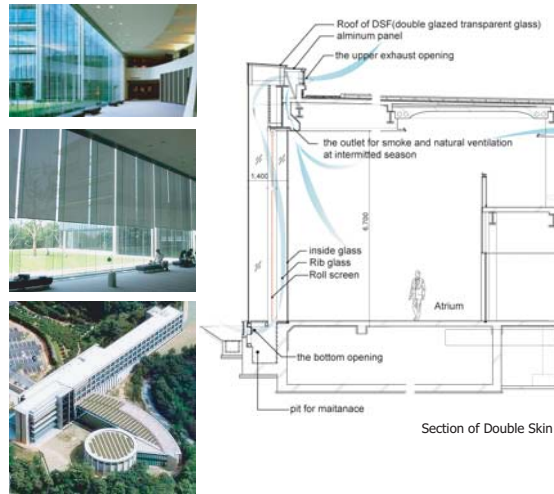
The roofs of the training block and the lecture theater, seen when looking down from the rooms of the accommodation block, have rooftop planting and wooden deck to landscape them and reduce the thermal loads radiated directly from them.



Double-Skin Facade with Roll Screen

"Decrease solar heat gain into the building"

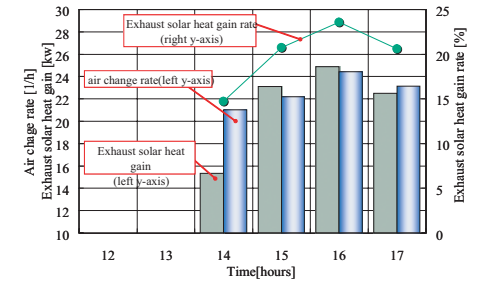
It was installed in the atrium located in the west façade of this building to realize the best design for thermal comfort and energy-saving.



Solar-Cut Effects of DSF

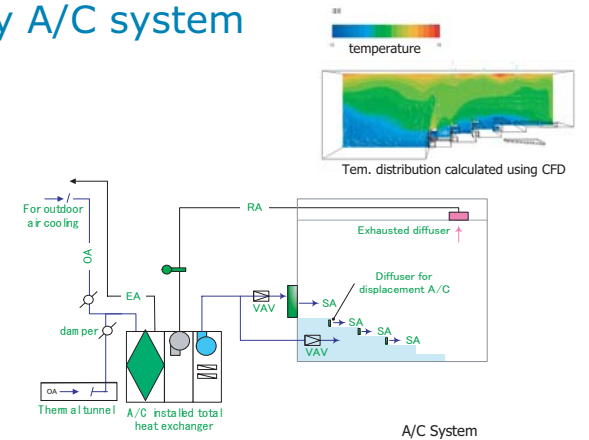
"The performance of double-skin facade"

#1 Air change rate of natural ventilation through the exhaust opening ranged from about 20 to 25 (1/hour) #2 The reduction rate of total solar heat gain to compared with those of non-natural ventilation was about 25%.



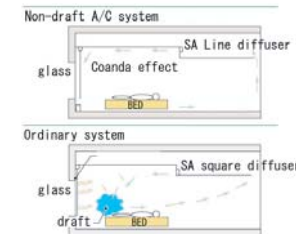
High Efficiency A/C system

"Displacement A/C system"



Comfortable Indoor Environment

"Non-draft Air-Conditioning system in guest room"



Precast Concrete Ceiling; All in One

