

						S3/5	ZEB/BEMS/renewable energy
O-21	Keywords	Y4	system or software	Z3/4	natural gas/electricity	D	Construction

Nikken Sekkei Ltd.

## Mirror Duct System to Use Natural Light

### Features

## Benefits of the Mirror-duct System

### Transmission of the natural light to any area

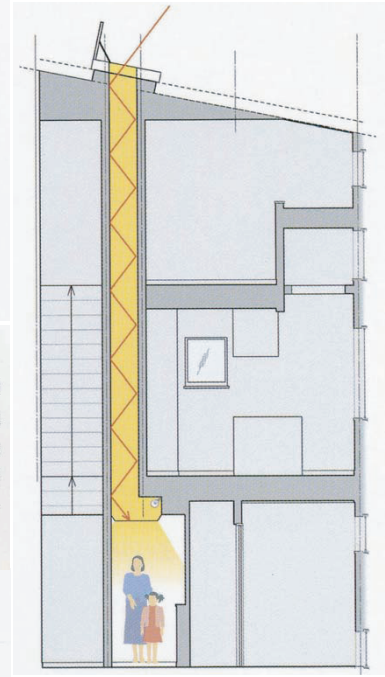
There are two ways in which the light duct can introduce natural light into the building. One is with the horizontal type, where light is captured at the exterior wall. The other is with the vertical type, where light is admitted on the roof and rooftop. Where the building has depth with areas difficult for light to access to, the vertical type is ideal. For windowless spaces where natural light cannot access to, such as the building core of a communal housing incorporating the bathroom, WC, kitchen, etc., conditioned by a building configuration of greater depth to frontage, the vertical type light-ducting system can serve to brighten with natural light.

### The effect of energy conservation

The Mirror-duct System, after installation, requires no energy to run or maintain it. It will continue to bring in natural light in its lifetime of service, enabling a considerable energy consumption saving. In an actual case of an office building, the saving in power consumption for lighting was calculated at 1/3 of an ordinary consumption. In addition to this, the CO<sub>2</sub> discharge from the lower lighting power consumption will be reduced drastically.

### Comfortable and healthful light

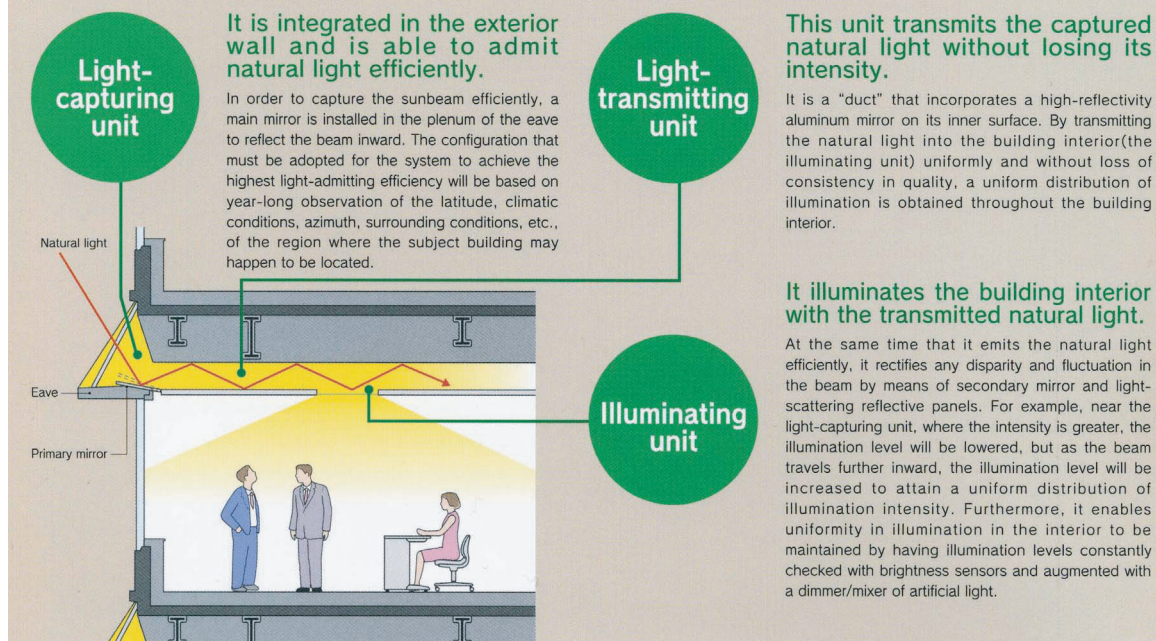
Natural light, it goes without saying, is part of the natural world, supplying a balanced mix of nutrients that life-forms depend on. It also provides healthful portions of ultra-violet rays that serve to sanitize.



### Basic Concept or Summary

## Mechanism of the Mirror-duct System

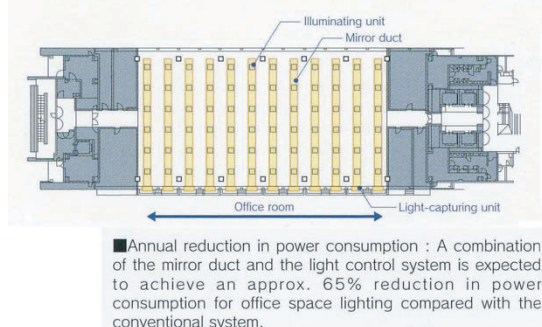
The Mirror-duct System is composed of 3 unit—the light-capturing unit, light-transmitting unit, and the illuminating unit. Each unit has special features, as illustrated below.



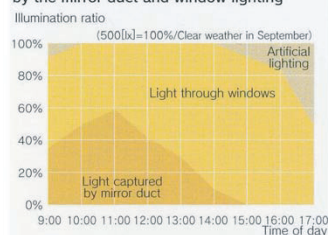


## Office Building

### Mirror Duct System Reduces Your Annual Power Consumption by Approx. 65%

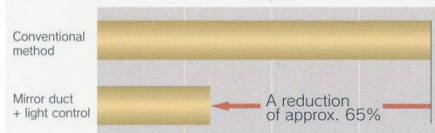


#### Desk-top illumination by the mirror duct and window lighting



#### Energy-reduction effects by mirror duct + light control

(Office room) Power consumption (kwh/year)

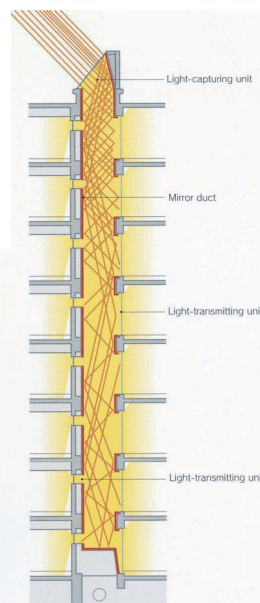
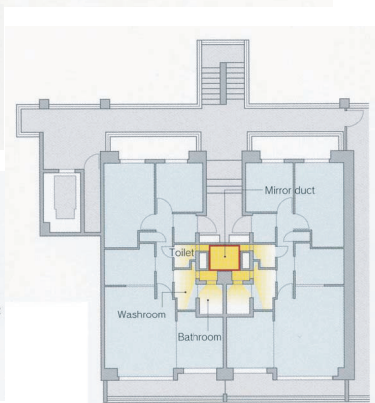
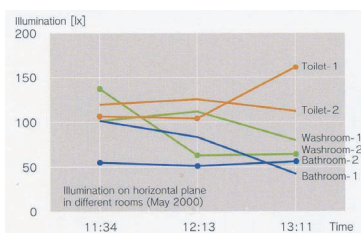


## Apartment House

The Mirror Duct System introduces natural light to provide sufficient lightness to windowless bathrooms, washrooms and toilets.

A sufficient level of illumination is ensured with natural light only.

In clear weather, illumination on the horizontal plane in each room (bathroom, washroom and toilet) reaches as high as 100 lx, thus ensuring a sufficient level of illumination with natural light only.



### ■ Major awards received:

Association of Building Engineering and Equipment - The 1st Environment and Equipment Design Award, Equipment and System Design Section I - Most Excellent Award

Japan Aluminium Association - Technology Award

Illuminating Engineering Society of North America - IES Illumination Awards - Award of Excellence

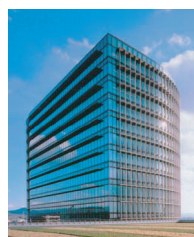
The Illuminating Engineering Institute of Japan - Japan Lighting Award

### Installation in Practice or Schedule

**Domestic** Strategic Planning and Management Office at Japan Aerospace Exploration Agency (Completed in 2003 at Tsukuba city, Ibaragi)



Toyota Motor Corporation, Headquarter office (Completed in 2005, Toyoda city, Aichi)



Underground canteen for employees



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