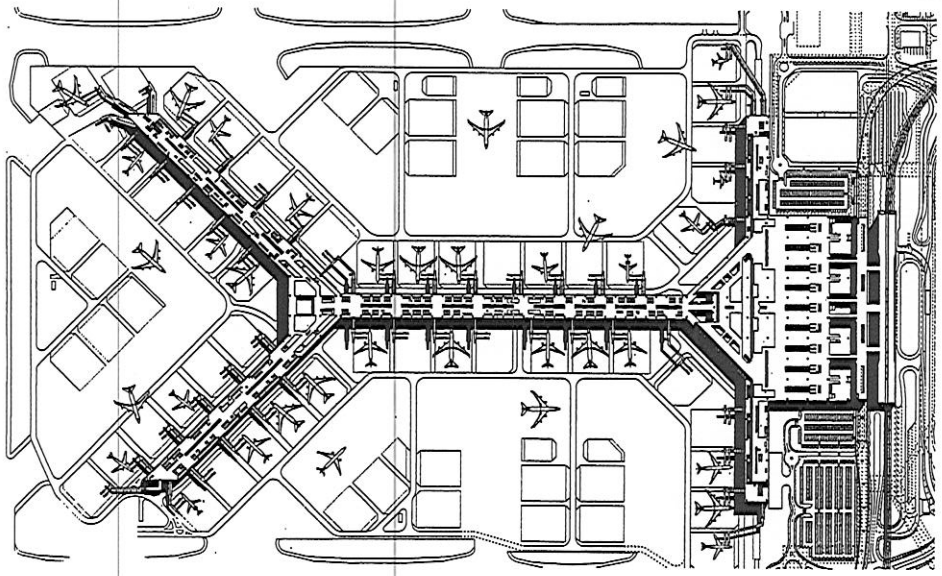
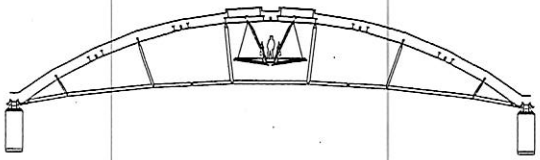
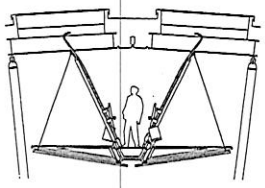
Section 5 Transport

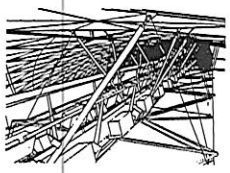
Case study 21 Hong Kong International Airport



Ground plan of the departures concourse (Foster and Partners).







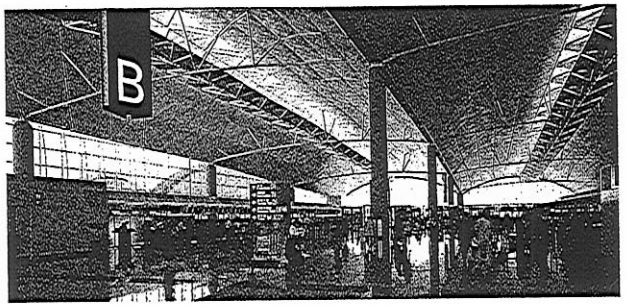
Ceiling gantry system to the departures concourse at first level (Foster and Partners).

The new international airport at Chek Lap Kok off Lantau island, Hong Kong, designed by Sir Norman Foster, is the largest airport in the world. It will be able to cope with 80 million passengers annually by the year 2040, equivalent to the current annual flow of Heathrow and JFK airports combined.

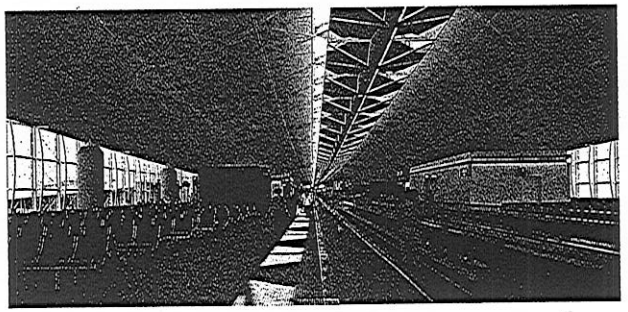
Air cooling in the hot climate of Hong Kong was a major consideration, and the air handling solution was part of an overall strategy to minimize heat gain and energy consumption. The lighting, both during the day and after dark, is an important aspect of this overall strategy.

Despite its deep plan (324 metres wide) the building is fully daylit from floor to ceiling through side windows and lines of triangular skylights in the centre of each of the nine barrel-vaulted roofs. The natural light is diffused by suspended reflectors along the roof gangway which provides access for maintenance, as well as support for the artificial lighting fittings. The skylights themselves are glazed with toughened laminated glass, coated to minimize solar gain; they cover some 6 per cent of the floor area of the terminal.

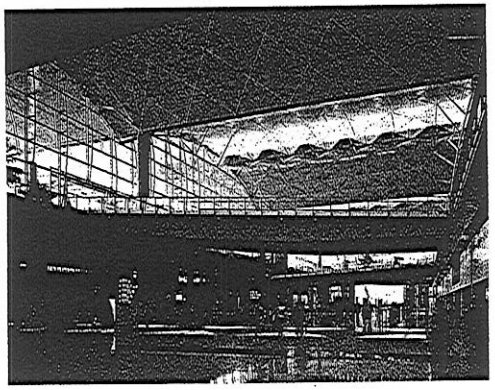
Architect: Foster and Partners; Lighting Design: Fisher Marantz Renfro Stone



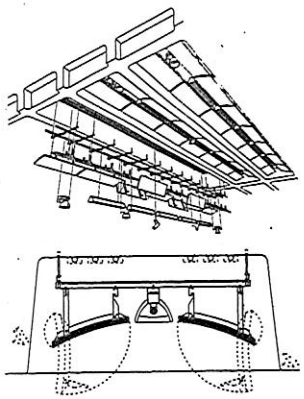
Departures check-in (Photographer Dennis Gilbert).



Departures spine during the day (Photographer Dennis Gilbert).



Arrivals meeting hall (Photographer Dennis Gilbert).



Detail of the special light fitting to indicate the acoustic reflector sides, removable for access and maintenance (Foster and Partners).

The artificial lighting in the concourse is provided by indirect uplighting, supported by the light reflectors' gantry. The light source selected is metal halide because of its 'colour rendering and colour temperature, efficiency and long life.'

In order to balance the daylight and at the same time reduce the use of energy, the lighting circuits are activated by a three phase operational control system which allows a balance to be struck with the level of daylight and creates a smooth transition between the two.

To avoid the impression of a uniformly-lit space and to add variety, certain areas are accentuated by additional downlights installed in such areas as atrium voids, immigration and check-in.

In the departures area the daylight is balanced by continuous wall washing, adding to the light on vertical surfaces and designed to give an uplift to the spaces.

In the arrivals hall a different lighting strategy is adopted, using lines of direct low brightness fluorescent fittings, direct mounted on to the concrete ceiling coffers.

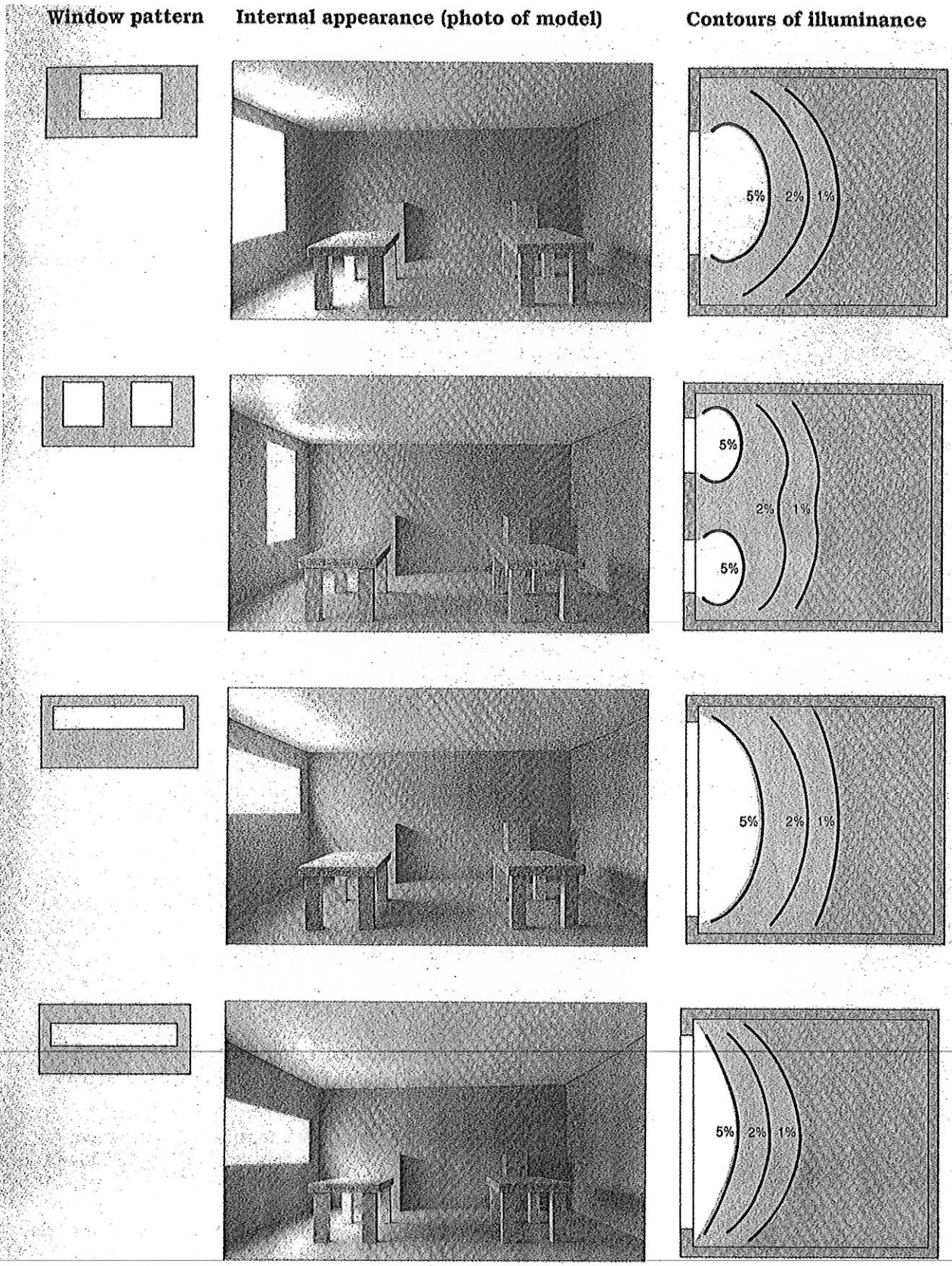


Figure 4.20
The effect of window patterns on light distribution and shadowing, taken from a series of windows where the window area in each case is the same. (James Bell and William Burt, *Designing Buildings for Daylight*, CRC Ltd, 1995, p. 56)