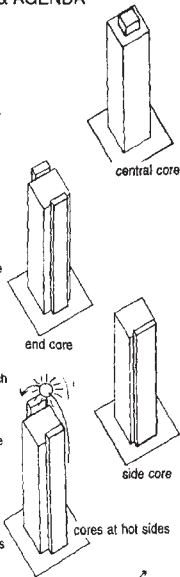
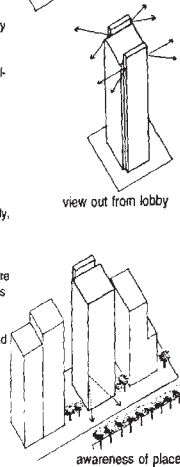


DESIGN PRINCIPLES & AGENDA

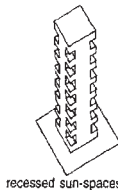
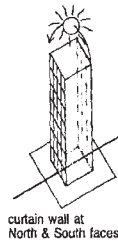
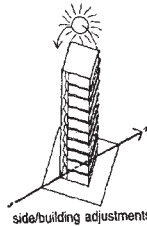
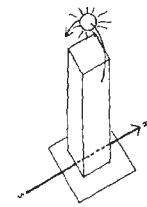
• Generally, the service-core position is of central importance in the design of the tall building. The service-core not only has structural ramifications, it's location can affect the thermal performance of the building, its views and determines what parts of the peripheral walls will have openings and glazing. Core positions in buildings can be classified into three types: the 'centre core', the 'double core' and the 'single core'. In the tropics, the cores should preferably be located on the hot-side of the building being the east and the west sides. It is evident that a double core has many benefits. By placing each of the two cores on the sides, they provide buffer zone as insulation to the internal floor spaces. Studies have shown that the minimum air-conditioning load results from using the double-core configuration in which the window openings run from north to south, and the cores are placed on the east and the west sides. These also applies to buildings in the temperate climatic zone.



• The lift lobbies, stairways and toilets zone are areas that should be given natural ventilation and a view out where possible. This means that they inevitably should be placed at the periphery of the useable floor-space as against being placed in the central-core position. External periphery placements of these parts of the building result in energy savings since these areas would not require mechanical ventilation, and require reduced artificial lighting besides eliminating the need for additional mechanical pressurisation ducts for fire-protection purposes. Aesthetically, by placing these on the periphery of the building, these areas receive natural sunlight and provide views to the outside which with a central core position would not be possible. In this way the building user on leaving an elevator at the upper floor can see out and be aware of the place (instead of entering an artificially lit lobby that could be anywhere in the world).

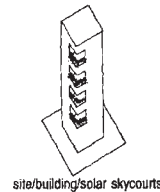


• Tall building are exposed more directly to the full impacts of external temperatures and radiation heat. Accordingly, the overall building's orientation has important bearing on energy conservation. In general, arranging the building with its main and broader openings facing north-south shows the greatest advantage with regard to reducing the building's solar insolation (and its air-conditioning load). As frequently happens, the geometry of the site would not coincide with the north-south geometry of the sun. In which case, the other built-elements of the building may expedient for planning purposes follow the geometry of the site (e.g. to optimise upon basement carparking layouts, etc.). The typical floor window openings should generally face the direction of the least direct solar insolation (i.e. north-south in the tropics). Some corner shading adjustments or shaping may need to be made for those site locations which lie further north or south of the tropics or for non-conformity of building plan to the solar path. Generally the window openings should orientate north-south unless important views require other orientations or openings. If required for aesthetic reason, curtain-wall may be used on these non-solar facing facades. On the other building faces, some form of solar shading is required while also taking into consideration the quality of light entering the spaces. In temperate zones, these transitional space can have adjustable glazing at the outer face so that the balcony or recesses can act as "sun-spaces" to collect solar-heat positively like green-houses, conservation, sun-room, etc.

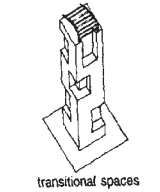


• Deep recesses may be used at the building's hot sides to give shading. A window can be totally recessed to become balconies or become small 'sky-courts' that can synergistically serve a number of other functions besides sun-shading. Placing balconies at the hot-elevations permit the glazing to these areas to be full-height clear panels. These can be

sliding openable panels to give access to these balcony spaces. The balcony spaces can serve as evacuation spaces in case of emergencies, as large terraces for planting and landscaping, as a flexible zone for the addition of future executive wash-rooms or kitchenette facilities.

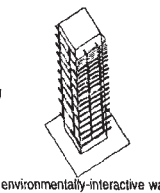


site/building/solar skycoorts



transitional spaces

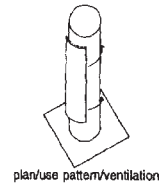
• Large multi-storey transitional spaces might be introduced in the central and periphery parts of the building as air-spaces and atriums. These serve as 'in-between' zones located between the insides and the outside of the building. These should be designed to function in a similar to that of the traditional 'verandahway' in the old shop-houses or the porches in the early 19th century masonry houses in the tropics. Atriums should not be totally enclosed but should be placed in this in-between space between the insides and the outsides and whose tops could be shielded by a louvred-roof to encourage wind-flow through the inner areas of the building. These may also be designed to function as wind-scoops to bring and to control natural ventilation to the inner parts of the building.



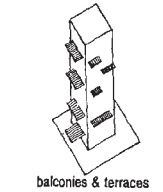
environmentally-interactive wall

• The external walls of the building should be regarded more as a permeable environmentally-interactive membrane with adjustable openings (rather than as a sealed-skin). In temperate climate, the external wall has of course, to serve both very cold winters as well as hot summers. In which case, the external wall should be filter-like and have variable parts that provide good insulative functioning in the cold periods and be operable in the hot seasons. Where in the tropics, the external wall should have moveable parts that control and enable good cross-ventilation for internal comfort, provide solar protection from the sun, regulate any wind-swept rain besides facilitating the rapid discharge of any heavy rain-fall.

• The building plan in addition to responding to the commercial intentions of the building (e.g. enabling single, double or multiple tenancies situations) should be reflective of the pattern of life and culture of the place and climate. Partly this involves an understanding of the spatial modalities of people, the way they work, the way culture arranges privacy and community. This can be reflected in the plan's configuration, its depth, the position and configuration of the entrance and exits, the means of movement through and between spaces, the orientation and external views as interpreted in the plan, and others. At the same time, the plan should also reflect the air movements through the spaces and provision of sunlight into the building. The space for work even in a high-rise commercial structure has to have some degree of humanity, some degree of interest and some degree of scale. For instance, the use of large terraces and skycoorts might serve as communal spaces as well as ventilating spaces into the upper parts of the tall building.

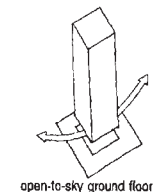


plan/use pattern/ventilation



balconies & terraces

• The ground floor in the tropics should preferably be open to the outside and be a naturally ventilating space. The ground floor relation to the street is also important. The introduction of the internalised indoor atrium at the ground floor may mean the demise of street-life. Free-standing fortress-like buildings also tend to separate the building from the pavement and further alienate the street. By being set back, it eliminates pedestrian movement and reduces the communication and movement into and around buildings from traffic and access points. Free-standing buildings become isolated buildings on isolated plots depicting an "island site"



open-to-sky ground floor

Figure 10.5

Some of Ken Yeang's principles for designing the ecologically sound tropical skyscraper

a different approach to the external skin of the building to that employed in the more northern climates of Europe and the USA:

Climate, viewed in the overall perspective of human history and built settlements, is the single most constant factor in our landscape, apart from its basic geological structure. While socio-economic and political conditions may change almost unrecognisably over a period of, say, one hundred years as may visual taste and aesthetic sensibility, climate remains more or less unchanged in its cyclical course.

(Yeang 1994)

Thus here we see Ken Yeang resolving his interests in ecological architecture, the climate of the tropics and his concern to develop new forms of regionally expressive architecture. Finally he combines this with his interest in a particular building type, the commercial skyscraper commonly found in the central business districts of Asian cities. These interests then range across practical, symbolic and radical constraints but can be absorbed into an overarching set of guiding principles with which Ken Yeang designs. So well resolved are these principles that he has now drawn them up quite explicitly into a sort of guide for use by members of his design practice (Fig. 10.5). After designing many notable tall buildings Ken Yeang was able to refine and extend these ideas sufficiently to publish them in book form (Yeang 1996).

Here again we see the way these guiding principles have been formed over a number of years of practising design. There is clearly a two-way process. On the one hand the guiding principles influence and set the mental context for each design process. On the other hand, each design problem enables the designer to learn more about the guiding principles and express them ever more clearly, eventually resulting in books and lectures. In this sense, design is also a form of research, it offers an action-based method of advancing knowledge. In the next chapter we shall see how important these guiding principles are during the design process and how they operate in practice.

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