



**1995 Technical Review
Summary**
by Kamran Safamanesh

Menara Mesiniaga

Kuala Lumpur, Malaysia
1356.MAL



Architect
*T.R. Hamzah and
Yeang Sdn.Bhd
Kenneth Yeang*

Client
IBM Corporation

Completed
August 1992

Menara Mesiniaga, or the IBM tower, which is also referred to as the bio-climatic tower, is located in Kuala Lumpur, Malaysia. The building is an icon for the company.

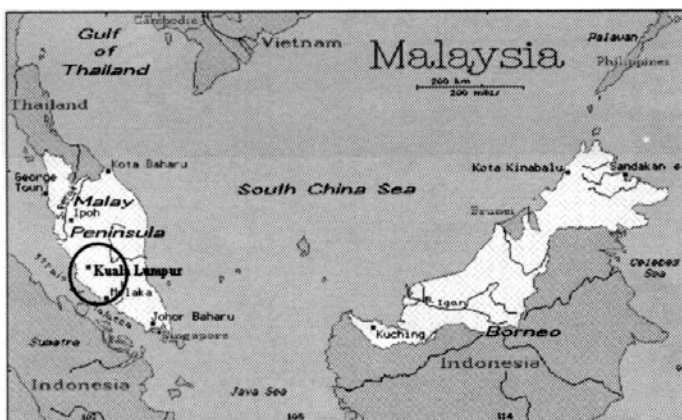
The name Kuala Lumpur is derived from Kuala which refers to a place where a smaller river joins a bigger river and Lumpur, or muddy, referring to the muddy confluence of the Klang river.

Early structures in Kuala Lumpur consisted of simple makeshift timber shelters for the miners. The town's focal point was the market (now called Medan Pasar). From the market there was a road leading to the mining fields in Ampang and a small street to the South called Market Street. Shops and houses in this area were built of planks with thatched roofs. This tower differs completely from past architecture, and has been described as "an example of High Technology."

This building incorporates the modern day office building with a sensitivity towards environmental issues, like natural lighting and natural ventilation. One of the other substantial points about this building is that it takes advantage of its existing environment by incorporating it into the function of the building.

The building brings together the principles of the bio-climatic approach to the design of tall buildings developed over the previous decade by Ken Yeang's firm.

The Mesiniaga is a 15 storey building with an area of 12,345.69 square metres. The floors are very well spaced with room for future expansion.



Selangor Darul Ehsan a region of the nation's capital; Kuala Lumpur is located in Central-West Malaysia

Menara Mesiniaga, Selangor Darul Ehsan, Malaysia

Context

Historical background

IBM needed a specific symbolic headquarters for their corporate office. Their intention was to create an atmosphere suitable and comfortable for their employees, along with an icon that represented their high technological products.

Yeang was commissioned by Ismail Sulaiman to design this building for IBM in 1989.

Appropriate site analysis was completed in June 1989 and preliminary sketches were done by the architect and his client in July 1989.

The preliminary design was approved by the client in December 1989, construction started in December 1990, and the project was completed in August 1992.

Among the five sites that the architect proposed, this site was specifically approved by the client.

Local architecture

Local architectural character combines the vernacular with the experimental and the modernist, but in general it is mostly contemporary. One style of building is British colonial. Another is of Chinese influence, especially the shop house. Then during the post war period, European influence was followed by

a Malaysian period, characterised by high rise buildings with high plot ratios. The most recent and significant style is the High Tech building.

The most consistent style of building around the Mesiniaga is the "shop house". The pre-war shop house design was derived from a variety of sources, of which the initial Chinese merchant's house was the most prominent. The shop house type may be classified in these three principal varieties: "Utilitarian" with simple wooden shutters and minimum decoration; "Neo-Classical" and "Art Deco".

As the name suggests, the shop house allows for both domestic and economic activity in the same building, with commercial activities

located on the ground floor and living accommodation for the family members upstairs. The upper storey projects over the street to provide a sheltered arcade or verandah for customers and pedestrians.

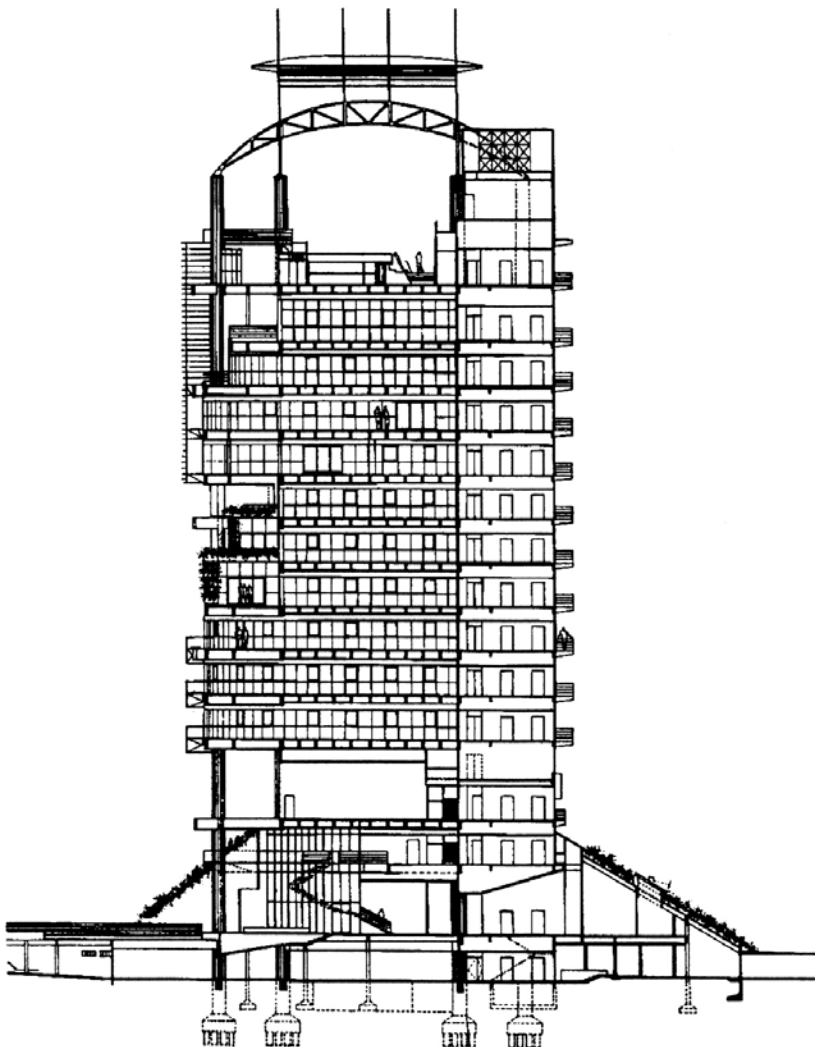
Climate

Climatically Malaysia is a hot and humid country; Kuala Lumpur is about 3 degrees North of the equator. Rainfall is heavier along the East coast than the West coast. Most urban and agricultural land is on the West coast and, consequently, so is most of the population. The country has no distinct winter or summer, temperatures are more or less consistently somewhere between 20 C and 40 C and humidity is between 60 and 70 per cent.

Site

Around the building there is a mixture of unplanned, beautifully lush places. There is a lake which is seen from every level of the building, some residential complexes and townhouses, office buildings, and a mosque. The largest shopping centre is also located within walking distance of the Mesiniaga. There is also a medical centre which is within view of the building. Overall, many of the surrounding buildings are low budget. They are 1 or 2 storey adaptations of older houses. A federal highway and two hotels are nearby, both are large scale structures. Also, an office block and commercial centre are in the vicinity.

The natural landscaping is very eye catching. There seems to be a substantial amount of growth within the area, in respect to community development. The traffic flow is moderate to congested at certain



*Cross Section
Scale 1:200*

hours of the day, due to the federal highway.

Topography

The topography is generally flat.

Programme

The client wanted to own the building; because renting is very expensive in the city centre. They were expanding, and needed a company identity. They decided to construct a building not only to express the quality of IBM products, but also as a symbol for their corporate offices.

General objectives

The client needed more space for their headquarters. But more importantly, the client wanted a showcase building to contribute to their marketing efforts and to represent projected commercial success. Also, the client wanted to occupy the building as soon as possible.

The architect's objectives, on the other hand, were.

- Control of fresh air and air movement
- Access to operable windows
- Potential for natural ventilation
- A good view
- Access to green space
- Access to transitorial spaces
- Receiving natural sunlight

- Control of lighting level
- Greater comfort in furnishings
- Ability to move furniture
- Provision of interior and exterior areas for relaxation
- A greater feeling of spaciousness
- Better heating and cooling
- Adjustable temperatures
- Less noise and distraction
- Better amenities
- Provision of recreational facilities
- Awareness of place
- Awareness of seasons of the year
- Recreation of ground condition in the sky though elevated gardens
- Bio-climatic functioning of the building
- Interaction with nature, sunlight and shadow

Functional requirements

The tower was designed to be flexible, to allow for an increase in usable floor area. It includes spatial requirements for marketing rooms, products, demonstration rooms, , exhibition spaces and an auditorium a gymnasium and a swimming pool.

Description

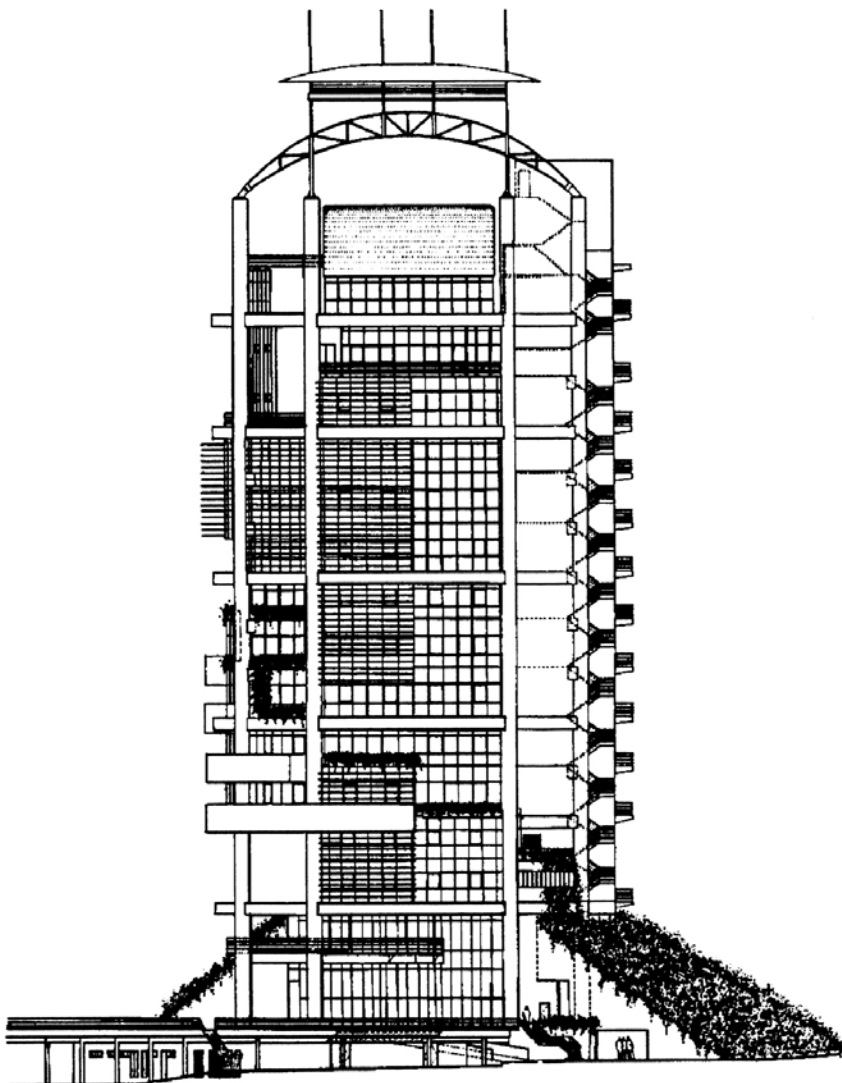
Building data

The site area is 6503 square metres. The plot ratio is 1:1.6.

Areas are:

| | |
|----------------------------------|--------------------------|
| Total net area | 6,741.50 m ² |
| Total net non-office | 476.34 m ² |
| Balconies, Skycourts & Pool Deck | 981.38 m ² |
| Circulation & Toilets | 2,318.45 m ² |
| Mechanical Rooms | 1,424.02 m ² |
| Car park (basement) | 404.00 m ² |
| Total | 12,345.69 m ² |

South-West elevation



Design concepts

An open site gave the freedom of choice and the corner location insured that it would become an important landmark. The federal highway also makes it an important vantage point, as there is a substantial view of the building from it.

The building has a very strong spatial organisation, there is a specific hierarchy to the location of each office, staircase, and terrace. The idea of being able to psychologically relate to transitional spaces has been carefully thought out.

The building not only fulfils user requirements, but goes further by expanding their use of the spaces.

There is a very strong structural expression on the building façade which is formed in a tri-partite way related to a raised green base, a spiraling planted body, and a crown. The façade is quite organic and random-looking, however it is also very specific. There is an order to the green spiral which starts at the base and circulates up to the top of the building. This order within its form, creates a garden in the sky and provides interest for the viewer's eye.

The structure is completely exposed. The crown of the building is the only decorative element which, in the future, will have more shading along with solar energy panels. No traditional motifs are used inside or outside the building.

The horizontal landscaping, which spirals around the building, is very well executed. Again, the idea of creating transition zones for both viewer and user is strengthened by the creation of landscaping and a stepped forecourt. When entering the forecourt, a cantilevered arm is very expressive of shelter.

Materials and technology

Materials:

The structural system is re-inforced concrete, with a steel structure used for the mezzanine and balconies.

Materials are divided among the following elements:

Foundation:

Bore concrete piles. The principal structural members are reinforced concrete and a structural frame uses steel outriggers.

Infill:

Brickwork for internal fire protected areas. Glazed panels for external cladding, and gypsum board for internal partitioning.

Rendering and finishes:

Imported aluminium composite panels

for cladding with local spraytile finish to other masonry areas.

Floors:

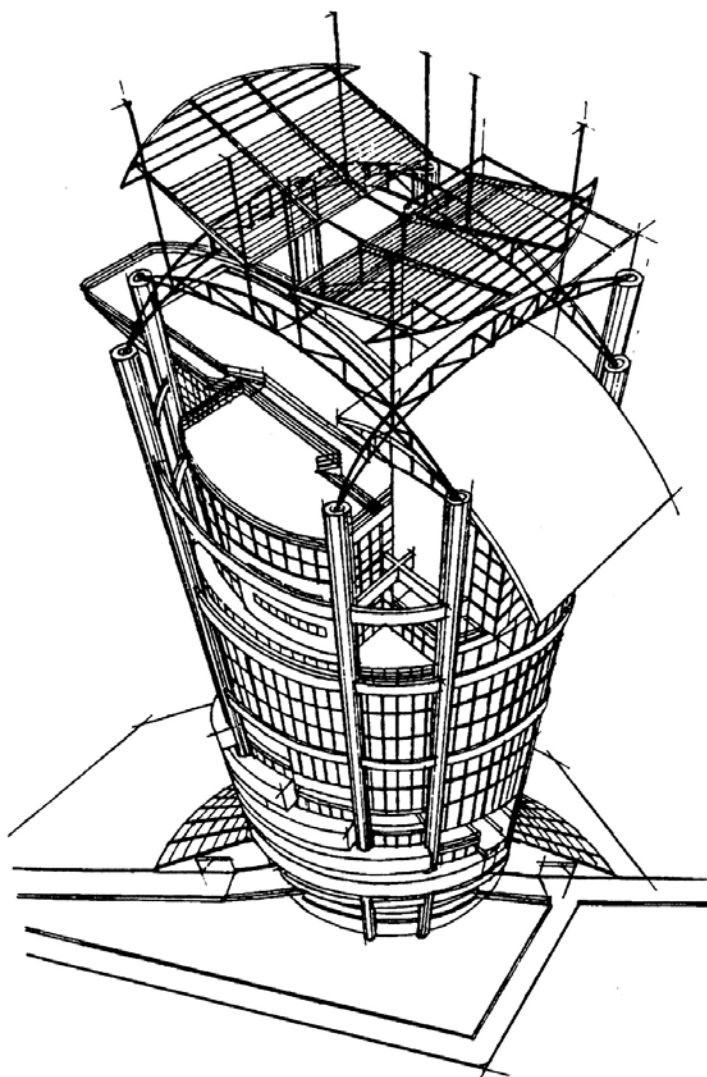
Imported granite in the lobby with homogenous local tiles for the poolside, toilet, and roof terraces. Imported carpet and tiles for the office areas and lift lobbies.

Ceilings:

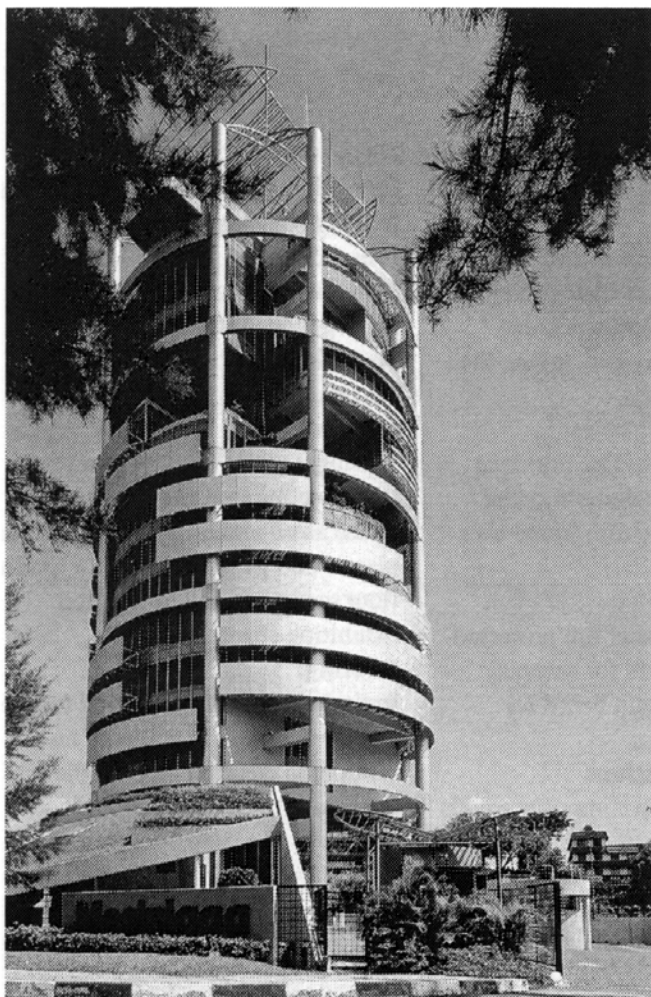
Imported mineral fibre board for office areas and lift lobbies. Fibrous plaster and gypsum board for ground floor reception, auditorium and exhibition space.

Roofing:

Imported metal deck roofing for the sky gymnasium. Local tiles on a reinforced concrete slab on the roof terraces. Also painted mild steel



Perspective



North View displays horizontal banding of floors and recessed terraces

outriggers for the roof structure and mezzanine.

Technology

Re-inforced concrete and conventional structural curtain wall was semi-unitised, half on site and half prefabricated and then moved to the site. Aluminium work on the façade was fabricated off site and later installed on site.

Building services include the provision of water, electricity and telephone.

Origin of :

Technology is international. Materials are imported and local. The labour force was Malaysian and Indonesian.

The professionals:

Architects: Local and Australian.

Contractors: SIAH Bros. (local)

Consultants: Local

Construction schedule and costs

History of project

The project was originally estimated to take 18 months to complete, but took 26. The starting date was June 1989 and the completion date was August 1992

Costs and financing

The main source of financing was the Islamic Bank and the financing was interest free. However there was a service charge.

| | |
|-----------------|---------------|
| Total cost | 20,000,000 RM |
| Interior design | 3,000,000 RM |
| Grand Total | 23,000,000 RM |

Comparative costs

A Ceser Pelli building, now under construction, is costing RM 220 per

square metre. Mesiniaga cost RM 148 per square metre.

Qualitative analysis of costs

Not relevant.

Maintenance

Maintenance service for the chillers and related air conditioning equipment

RM 29,000 p.a. (RM 2,416.67 p.m.)

Maintenance and servicing of the building automation system

RM 7,260 p.a. (RM 605 p.m.)

Maintenance of hydraulic services

RM 1,800 p.a. (RM 150 p.m.)

Maintenance of fire services

RM 3,600 p.a. (RM 300 p.m.)

Maintenance and servicing of hi-klean system

RM 1,560 p.a. (RM 130 p.m.)

Maintenance of passenger lifts

RM 26,880 p.a. (RM 2,240 p.m.)

Servicing of swimming pool

RM 6,600 p.a. (RM 550 p.m.)

Solid waste disposal service

RM 5,340

Housekeeping

RM 150,600 p.a. (RM 12,550 p.m.)

Service and maintenance of package air conditioning units

RM 1,440 p.a. (RM 120 p.m.)

Maintenance of landscaping

RM 22,200 p.a. (RM 1,850 p.m.)

General pest control

RM 3,100 p.a.

Automatic door operators

RM 1,500 p.a.

Servicing of generator set

(to be serviced twice a year)
RM 1603.40 per service

Water treatment
RM 3,195 p.a.

Secondment of charge man
RM 34,760 p.a. (RM 2,674 p.m.)

Electrical inspection
RM 2,160 p.a. (RM 180 p.m.)

Security services
RM 143,489 p.a. (RM 11,957 p.m.)

Technical assessment

Functional assessment

Except for climatic problems such as rust, the functional requirements have been completely anticipated and provided for.

Climatic performance

According to Yeang's request, a

climatic analysis of the building was conducted by Norman Disney and Young (consulting engineers), using conventional unshaded curtain wall construction. By reviewing the arrangement of the building, cooling loads were recalculated based on the following arrangement:

1. All sun-screens removed.
2. The low height brick wall behind sun-screens replaced with a glazed curtain wall.
3. All shading effectively removed from the balconies.

According to the engineers, the total increase in cooling loads in the building was calculated to be approximately 125 KW with a corresponding increase in supply fan motor power of approximately 15 KW.

The estimated increase in installation and operating costs are as follows:

1. Installation / fire cost
US\$ 160,000.00
2. Operating cost per annum
US\$ 42,000.00

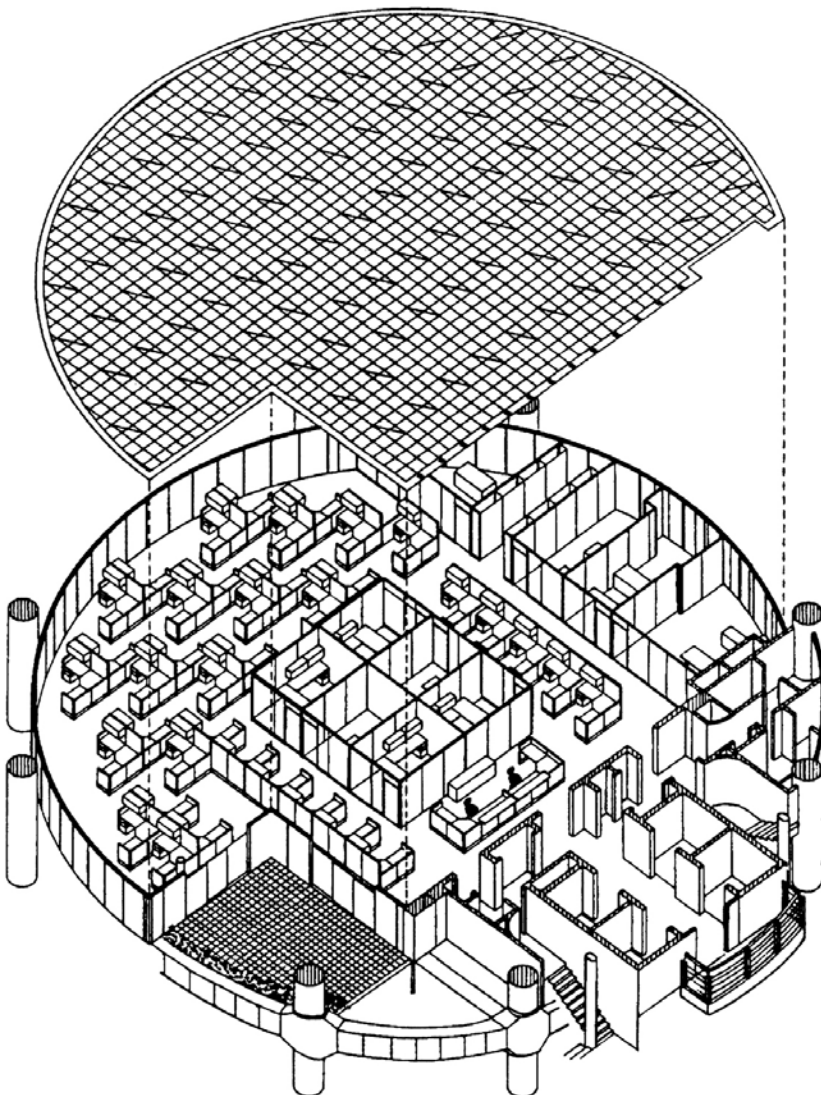
Artificial lighting is reduced due to natural lighting, but sun and shading effects in spaces are sometimes appalling. Ventilation is by air conditioning, as well as natural ventilation. There is beautiful natural lighting and ventilation in the staircases as well as in the toilets.

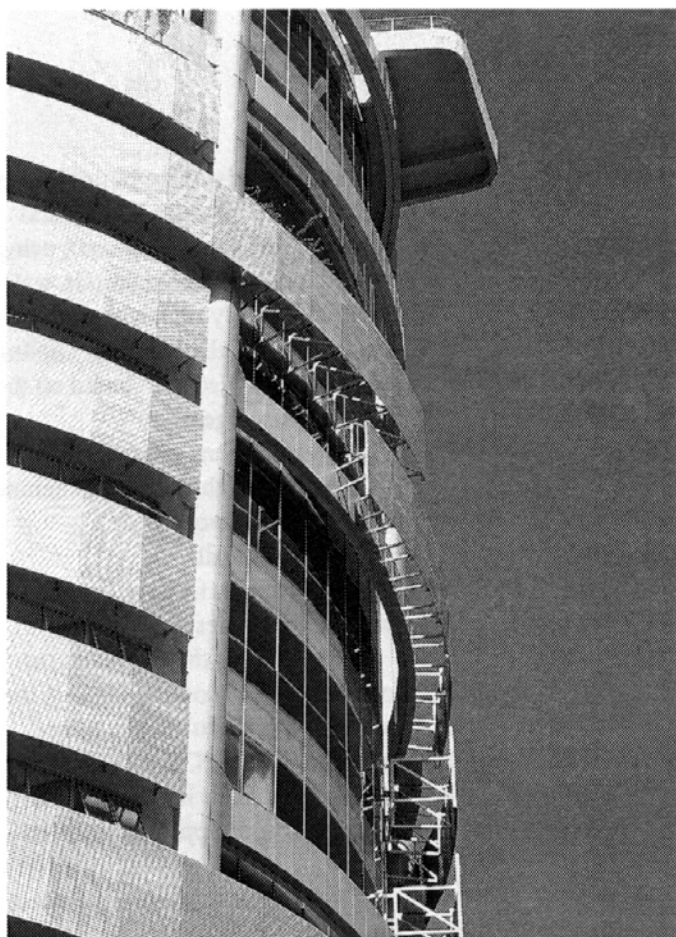
Acoustics are provided by mineral fibre board in the ceiling and padded fabric for the walls in the auditorium. Also the use of carpet in the offices and auditorium helps in this regard.

Orientation is made easier by the placement of windows along all elevator lobbies. One can immediately locate oneself after exiting the elevator.

The service core is on the East, which helps block out the morning sun. By pushing the core outwards, the architects have taken advantage of natural ventilation and natural lighting.

Office floor partitioning





*View of
sunscreens and
over-hanging
sundeck balcony*

Choice of materials and level of technology

The choice of materials is excellent as far as expressing the concept, and the corporate image of technological products. However, due to climatic circumstances, some materials are not well considered. Glass, steel and aluminium do not correspond to local technologies.

There is a tangible transition in material use as one walks through the building. As the spaces change, the use of materials becomes warmer. The steel elements and structures were specifically designed by the architects in drawings submitted to the engineers. It only remained for the engineers to size the pieces to be built. The cladding was imported from Japan, as was the suspended glass in the ground floor lobby. Interior panelling, partitions and

carpeting were imported from the United States.

The architect submitted designs, the engineers sized them, and the contractors submitted costs and built the structure. This process shows that the level of technology is appropriately arranged. Pre-fabricated forms were not needed since any form the architect wanted was built.

Maintenance

Due to the high level of humidity, some leaking and rusting has occurred: rusting of flat roofs due to stagnant water, water stains in the dining hall and kitchen, salt formation below the poolside, warping of panels in gymnasium, leaks in the Jacuzzi room, leaking of aluminium mullion in the library, formation of puddles of water in the forecourt.

Paint touch-ups are needed, Other problems have been noted.

Design features

Design features due to the peripheral core position are excellent. For instance, no high pressure ducts are needed. The view onto the exterior, the awareness of the place, and the natural ventilation are also outstanding.

Other advantages are:

- Natural sunlight.
- Safety in event of total power failure.
- A solar buffer effect.
- Orientation in all cardinal directions for maximum sun and wind.
- Terraced gardens on each level.

The integration into the site is very well executed. The surroundings are low rise buildings and very mixed in their materials and style. This contributes to the effect of Mesiniaga's style, texture and climatic performance.

The serenity of the spaces and the contact with the outside in every part of the building, are extremely successful.

Spatial hierarchy at the base of the building is first recognized in the raised entrance garden, then seen in the different office levels and finally seen in the top level with the pool, and above it at the crown. On each level, another spatial hierarchy exists. The centre is the upper management, surrounded by the management, and along the edges is the general staff. This is unusual for an office layout. In most office buildings the perimeters, which provide better views, are given to the management. In this case it is exactly the opposite. The spatial hierarchy is the opposite of staff hierarchy by title.

Users

The users are the IBM corporate employees. However, not only does the Malaysian company benefit from this building, but also the surrounding neighbours.

Users' response

All are extremely pleased.

Project personnel

Architects

T.R. Hamzah and Yeang SDN.BHD

Contractors

SIAH Bros. SDN.BHD

Consultants

Structural and Civil Reka Perunding

Mechanical and Electrical

Norman Disney and Young SDN.BHD

Quantity Surveyor

Baharuddin Ali and Low SDN.BHD

Landscape

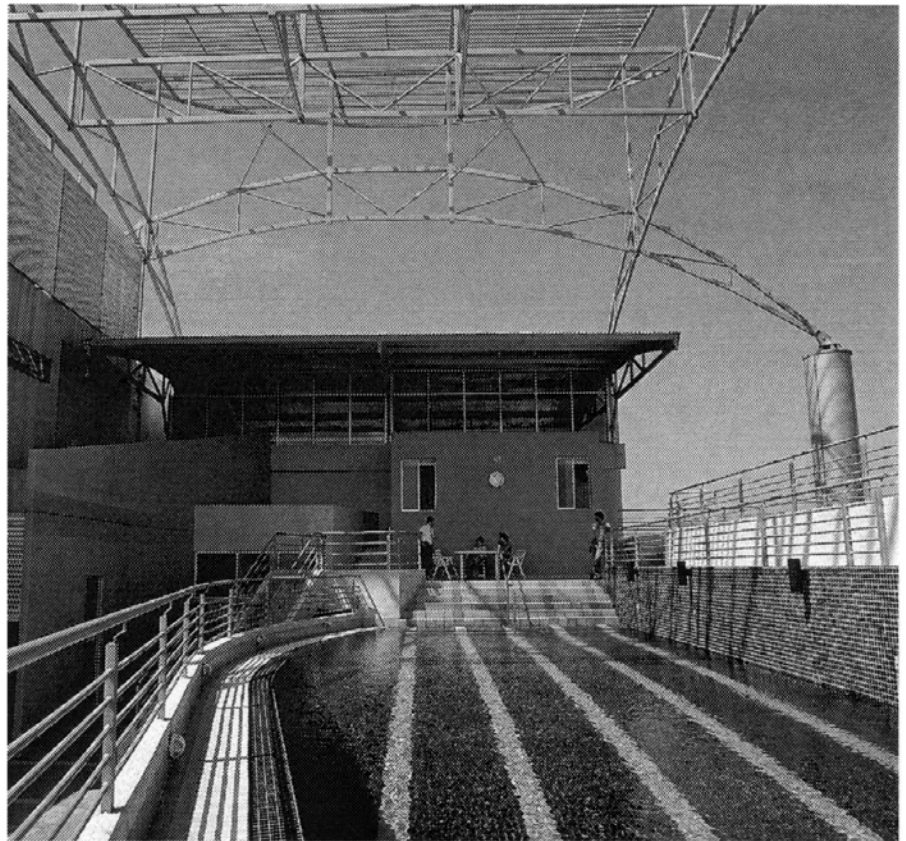
LAP Consultancy

Steel Worker

Sediabena

*View along the sundeck
and swimming pool
towards the gymnasium*

***Kamran Safamanesh
May 1995***



Built Form

Planting and Terraces

Orientation

Glazing and Shading

