



by Hana Alamuddin

Salinger Residence

Bamgi, Selangor, Malaysia



Architect

CSL Associates: Jimmy C.S. Lim

Clients

Rudin and Puan Salinger

Design

1985

Completed

1992

I. Introduction

The Salinger house, or Rudinara, is a single-family residence built exclusively of timber in the traditional way of the Malays. The project's site is in an old rubber plantation south of Kuala Lumpur. The house is not just a two-bedroom home; it has become a centre for Malaysian cultural activities run by the Salingers themselves. The main governing factor in the project was a concern with appropriate design and technology for climatic conditions in the tropics. The house is completely naturally ventilated. Although the project uses a traditional construction system, its form and planning concept are quite modern.

II. Contextual Information

a. Historical background

Malaysia (area: 333'000 km²) straddles the South China Sea and consists of thirteen states. Eleven of the states are on the peninsula (132'000 km²) while the states of Sabah and Sarawak are on the island of Borneo. The population of Malaysia is about 22 million and consists of three main ethnic groups: the Malays, who are Moslems, constitute 50% of the population, the Chinese constitute 32% of the population, the Indians constitute 9%, and the other ethnic groups make up the rest of the population. Malaysia is very rich in natural resources such as tin, crude oil, timber, etc. Its economy has expanded rapidly over the last decade in manufacturing, services, and the construction industry. Manufacturing is expected to continue to grow up to the year 2005 under the second industrial master plan.

The peninsula of Malaysia is made up of small kingdoms. In the fifteenth century the kingdom of Malacca was created by a prince who converted to Islam. Malacca was conquered by the Portuguese in 1511, who later fell to the Dutch in 1641. In the eighteenth century, the British, in pursuit of trade, leased the island of Penang from the Sultan of Kedah. In 1819 the British East India Company founded Singapore and in 1824 acquired Malacca. Tin mining started in the 1850s and the British took control of the whole peninsula by convincing the rulers to accept British advisors. Malaysia was seized by the Japanese in 1941 and remained under their rule until the end of World War II. The independence movement that emerged had deep divisions due to religious and linguistic differences. However, the Alliance political party that emerged in the 1950s was multi-ethnic. The Alliance won the first nation-wide elections in 1955 and, with the British, worked out a constitution creating a federal state with a two house parliament. Malaysia gained its independence on August 31, 1957. Between 1948 and 1960, the government fought a communist-led rebellion that claimed 11'000 lives. In 1965, Singapore left the federation. In the 1969 general elections serious rioting broke out in the capital, Kuala Lumpur, and emergency powers were invoked until 1971, when the parliament met and the new prime minister announced an economic policy to alleviate poverty in general and the conditions of the Malays specifically. He also broadened the Alliance into a National Front to include some opposition parties. The front won the 1974 and 1978 elections and are still in power, led by Dr. Mahathir bin Muhammad, the present Prime Minister.

b. Local architectural character

Residential architecture in Malaysia tends to be either high-rise apartment buildings in the cities or row housing developments in the new towns. The garden-villa typology is common for higher income residences, which are built in a variety of forms, shapes, and sizes. Usually of concrete frame and brick infill construction, they are finished with plaster and paint. Pitch roofs are very common and blue-coloured roof tiles are very popular. For the most part, these houses are fully air-conditioned and are sealed from the external environment.

The traditional Malay house is a timber house raised on stilts. It is a post and beam structure with

infill panels of timber or bamboo. It has a simple rectangular form oriented toward Mecca and a dominant overhanging pitched roof. This type of house is still found in the rural areas of the country in clusters called the *Kampung*, or villages. These houses are a response to the climate and environment; they maximise natural ventilation while protecting from monsoons and strong sun. This is achieved with the large overhanging roofs. The veranda that surrounds the house on three sides is called the *anjung* and is the social space for family and visitors.

c. *Climatic conditions*

Malaysia lies between latitudes 1° and 7° North and longitudes 100° and 119° East. It is therefore in the tropics. Its climate is both hot and humid with heavy rainfall. The rainy season is from April to May and October to November, and the average annual rainfall is between 250 and 300 cm. Air temperatures are uniformly high throughout the year, with a mean maximum temperature of 29°C to 32°C during the day and a mean minimum temperature of 22°C to 24°C at night in the coastal areas.

d. *Site context*

The Salinger house is located in an old rubber plantation in the district of Bamgi, 15 km south of Kuala Lumpur, off the main north-south highway. Bamgi was originally an outlying area with a small rural settlement, called the *Kampung Sugai Merab Luar*. A university was set up, followed by a small industrial estate that led to the slow residential development of the area. The immediate surroundings of the site consist of two to three storey, nondescript, concrete villas owned and occupied by teachers from the neighbouring religious schools and university.

e. *Site topography*

The three-acre site (12'140 m²) is rectangular with gentle slopes from West to East of approximately 10%. The land is heavily wooded with rubber trees and is approached from the South.

III. Programme

The client, Dr. Haji Rudin Salinger, is an American citizen who has lived in Malaysia for over thirty years and has a keen interest in Malay culture. Dr. Salinger and Puan Munira Salinger, his wife, wanted to build their home in the rural area near the university where he worked. They specifically wanted a modern house that reflected Malay culture and their Islamic faith. They approached the architect with very simple and specific requirements. They wanted a two-bedroom house. Haji Salinger is a keen cook and wanted his kitchen to be open to the rest of the house so that he can entertain his guests while cooking.

IV. Description

a. *Project data*

The project is a two-storey, two-bedroom house built of timber on stilts. The total area of the project is 289 m², and the ground floor is 26 m². The private section of the house is on the top floor and consists of a sleeping area, a bathroom, a work area, and a prayer area. The first floor is the public section of the house which is made up of the living room, dining room, kitchen, guest room, study and bathroom. Also on this floor is the terrace, or *anjung* and its roof, the *waqaf*. The *waqaf* in Malaysia is a gift of money that is translated into a physical structure to provide shade for the men working in the rice fields. Under the large roof, a raised platform is used for prayer. The ground floor has a core bathroom and utility room and the space under the structure is used for storage, a drying area,

gardening and batik making.

b. *Evolution of design concepts*

The house is designed with ecological, sustainable principles in mind. It is located virtually in the middle of the north-south length of the site and about 6 m away from the Western boundary. The house is on a high elevation to reduce water run-off through the building during the monsoon rains. It is oriented to capture the prevailing winds. In a hot and humid climate, the main factor for thermal comfort is natural ventilation since it creates air movement that disperses humidity and allows evaporation.

The architect's intention in lifting the house on stilts was to reduce the impact of the structure on the land and the environment. No major earth works were done, the natural contours of the site were kept, and the topsoil was preserved. The landscaping around the house was kept as natural and as undisturbed as possible. The client has since also added a variety of trees that produce spices and fruits relevant to his culinary hobby such as a cinnamon tree and cloves trees.

The client's brief was centred around a three activities: cooking, dining, and living. This three-point relationship was interpreted geometrically as a triangle for indoor living that was juxtaposed onto a triangle for outdoor living. This created a new trilogy of living, dining, and terrace. Hence the basic form of the plan is two equilateral triangles abutting each other. The separation between public and private is complete as each is on a separate floor. Also, the geometry of the house is such that in the private space, one of the walls faces Mecca as in the orientation of the traditional Malay houses. Vertical circulation space is kept to a minimum within the granite core that connects all the floors.

The main influence on the design of the house is the climate. The open plan ensures cross ventilation, the large overhanging roof ensures solar protection for the walls and protection from the monsoon rains. Cross ventilation is created by the open floor under the skirting all round the house at a low level and the ventilation grilles over the windows and in high points in the roof. Air is thus pulled through the whole space of the house. Open ventilation grilles made up of three vertical timbers crossed by three horizontal timbers, known locally as *sekawan tiga* or three friends, are the only decorative features on the façade.

c. *Structure, Materials, Technology*

The building utilises the traditional Malay construction system using a post and beam timber structure. The foundations of the timber columns are reinforced concrete with 1.80 m deep foundation pads.

The core of the building is a reinforced concrete frame with granite rubble walls. The timber is a local hardwood called *chengal*. This is a very dense timber that is used for boat building as it is highly resistant to water and termites. It is known traditionally as the king of wood. It seems that although all the infill panels and framework are made from this timber, there are three studs in one of the walls that are of a different wood. When the carpenter was asked about this he explained that the whole house cannot be of *chengal* as the king needs subjects.

All joints are made of timber. There are no metal connections at all. Where required, timber dowels and traditional joining techniques were used throughout the house. Originally, the details were designed with various metal fittings, however, when the carpenter got involved and it became possible to build the project in a completely traditional way, the architect, in co-operation with the carpenter, changed all of his details to fit the craftsman's ways of doing things. The only nails utilised are in the *anjung*. The floors of the house are also of *chengal* and are simply laid, and are tongue and grooved. This allows the timbers to move, reinforcing the special experience and the quality of the timber

construction. Ceilings, when they occur, are of fibre cement board but on the whole the underside of the roof is left exposed showing the tiles and the structure. The roof tiles are hand-made locally. Their variation in colour adds a lot of richness to the house. The ridge tiles had to be formed especially due to the unconventional geometry of the triangular roof. The floor tiles on the ground floor are local slate.

All external timber is left in its natural state. It is treated only with *minyak daman*: the oil from the *daman* tree that improves its water resistance. The concrete pads are carefully detailed to quickly disperse the water away from base of the timber posts to avoid rotting.

The house was built completely by hand by traditional Malay carpenters from the state of Kelantan on the east coast of the country. The only machinery used was a small concrete mixer. Three to four carpenters would work at one time on the project which took six and a half years to build. The staircase and stone core were the first things to be built. Then, the structural columns independent of the stairs were put up. The columns were lifted into place by a series of pulleys, hoists, and ramps. The columns were cut with an axe and are planed into eight-sided posts. At the lifting of the first column, *Surat Yassine* (Tiang Sri), from the heart of the Qur'an, and the *Doa'a Salamat* were read by the religious teacher. The two readings form a local, traditional building ritual performed to ensure the success of the endeavour. As the stone structure was built up, the timber structure was tied into it. The roof was then assembled on the ground, taken apart, lifted by a series of pulleys, and reassembled 16 m above the ground in mid-air. The tiles were then taken up by a series of ramps and installed so as to quickly gain cover from the rain. The floors followed and finally the timber walls and internal finishes.

Electricity was pulled from the main electrical supply in the region. Water was also piped in initially. Now the client has built himself a water reservoir at the end of the garden. For sewage, a septic tank was installed in the ground. The client devised a system which solved a mosquito problem by putting a three-inch layer of polystyrene in the tank that denies the mosquitoes access to the surface of the water, thus eliminating their ability to breed.

d. *Origin of technology, materials, labour force, professionals*

The timber for the house came from three *chengal* trees selected by the master carpenter Ibrahim Adam and a Forestry Officer. Two were selected from the forests of the Gua Musang area of Kelantan and the third from Hulu Besut in Terengganu. These were felled, cut, and brought to the site by lorry. Because the maximum size of the timber allowed on the lorry is 24 ft, the timbers had to be cut and then joined again on-site. The builders were a team of six Malay carpenters, originally from the Bachok district.

Although the technology of timber building used was very traditional, the geometry of the house and the stone core was new. The only consultant involved was the architect, who has extensive experience building with timber in Malaysia and is a believer in the use of timber as a low energy, sustainable material best suited to the climate and environment of his country. No engineer was involved.

The design was started in June 1985 and was finalised in October 1985. Work started on site in February 1986 and ended in June 1992.

The client funded the building of his house through private savings and a loan from the bank. The total cost of the project was USD 112'000. The cost of the land was USD 24'000. The cost of the materials was USD 76'000. The cost per square metre was USD 387. To give a comparative price for this sort of one family residence is very difficult because the range is quite open depending on the requirements of the individual client and the quality of finishes, etc.

As for maintenance costs, the client has not had to do any maintenance. Apart from regular cleaning, no other issues have arisen. Since the only source of cooling are two fans, the cost of running the house is negligible.

VI. Technical Assessment

The house functions both as a home for the Salingers and a cultural centre of various aspects of Malay culture. The house plays a very important role in this total experience. Dr. Salinger is extremely proud of it and gives the visitors a detailed account of how this project was built. He is a gentleman who has a lot of respect for the craftsmen and was closely involved in the building of his house.

The division between public and private allows the Salingers to live very happily in their home while receiving visitors quite easily.

The climatic performance of the building is successful in maintaining pleasant, comfortable interior conditions throughout the day. The orientation of the house toward the breeze is evident, as the wind is distinctly felt under the *waqaf* at night. Rough data was collected by the client for this review. It showed that, in principle, the temperature inside the house in the afternoon is always several degrees lower than the ambient temperature on the *anjung*. The control of glare afforded by the large overhang of the roof adds to the thermal comfort as the light enters into the rooms.

Timber was chosen for this project not just because it is the building material of traditional Malay houses, but also because the architect is concerned with designing according to ecological sustainable principles. Timber is a sustainable material which has been shown in research to consume far less energy than other building materials. Compared to timber, concrete consumes 3 times as much, steel, 17 times as much, and aluminium, 70 times as much (Prof. J. Bowyer, University of Minnesota).

There are also issues of waste material and water and air pollutants created in the production of man-made materials: carbon dioxide, carbon monoxide, etc. ("Environment Properties of Timber", research paper commissioned by the Forest & Wood Products Research & Development Corporation).

The use of tropical timber was debated in the UNCED conference in Rio. As a result, The International Tropical Timber Organization (ITTO) was created to look into the difficult issues like conservation versus development, international versus national concerns. The ITTO created its own action plan for the year 2000 to reach a fully sustainable timber industry. The sustainability of timber hinges on proper forest management. This means controlled and properly executed felling concessions according to set specifications that would preserve the forest and allow new growth for its future.

The main danger to the tropical forests is agriculture. In the 1970s in Malaysia, a government policy to create a large-scale agricultural development to eradicate rural poverty led to the loss of large areas of forest. The main use of tropical timber is as fuel by the indigenous population.

The trend in preserving tropical rain forests now, even in Europe, is to make sure that the forests are given economic value so that they aren't replaced by other land uses. For example, the Dutch and the German governments have withdrawn a decree that restricted the use of tropical timbers. Moreover, the economic value of the forests linked to a strong industrial sector will create jobs and tax revenues which would be used for forest management (In Malaysia the industry provided 240'000 jobs and USD 5.4 billion in export earnings in 1995).

In its action plan the ITTO concludes "that the survival of forests depends to a great extent on increasing the perception of their value and the benefits they provide". Malaysia has had systematic forest management since 1901, when it was set up by the British and is one of only three countries

that is set to reach ITTO targets by the year 2000 .

Although the level of technology used in this project was fairly basic (it was all hand built), the form and geometry of the project took the timber structure and its detailing to a new threshold. This was made possible by the craftsman and architect working closely together. Isometric views were drawn for every joint in the structure and the roof was built on the ground before raising the timber and building it in place.

The timber is ageing gracefully, changing colour with time. Timber structures of some palaces in Malaysia are over three hundred years old. The average life of traditional timber houses is, it seems, 150 years.

The form of and breaks in the roof and the form of the plan reduces the mass of the building. The columns of the house blend with the rubber trees on the site, integrating the house with the landscape. The natural landscape slides under the house, preserving the reading of the contours of the site.

As for the articulation of interior spaces, the open plan and the form of the triangle (which has a strong sense of perspective) create a feeling of a space that is much larger than what is actually there. The open core over the living room also gives the space an extra sense of height.

VII. Users

The client, Dr. Haji Rudin Salinger, is of French and German origin. Born in Canada and educated in the United States, he came to Malaysia in his thirties as a Peace Corps volunteer. He returned a few years later, converted to Islam, settled and married. He is a physicist and has lived and worked in Malaysia for over thirty years. He is involved in education and has worked with UNESCO and taught at the National University for fourteen years. He has written six books on education, has three patents to his name, and has written over fifty articles about on subjects including Malay crafts, cooking, and culture. He has a consultancy firm that provides expatriate orientation services. This started as casual lessons on Malay cooking and herbs and has now become a regular cultural event. Visitors are invited to spend a whole day in his house where they take part in typical Malaysian activities such as batik making, rice grinding, etc.

Needless to say the client is very happy and is proud of his house as he supervised the construction every day and was instrumental in finding the craftsmen. He tells many stories about the building of the house: when the workers from the electricity board came to install the pylon in front of the house, they came, looked around, and left without saying a word. They returned a few days later with a timber post and pre-war ceramic fittings because they did not want to spoil the view of the house with a modern looking, metal pylon.

Neighbours frequently bring visitors to see the house which has been featured on several television programmes, in local papers, and in magazines such as the Badan Warisan Annual Report, the publication of the Heritage Society of Malaysia, and Airport, a freebie given out at the airport .

VIII. Persons involved

Dr. Haji Rudin Salinger, Client
Mr. Jimmy Lim of CSL Associates, Architect
Ibrahim bin Adam, Master Carpenter

Hana Alamuddin
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