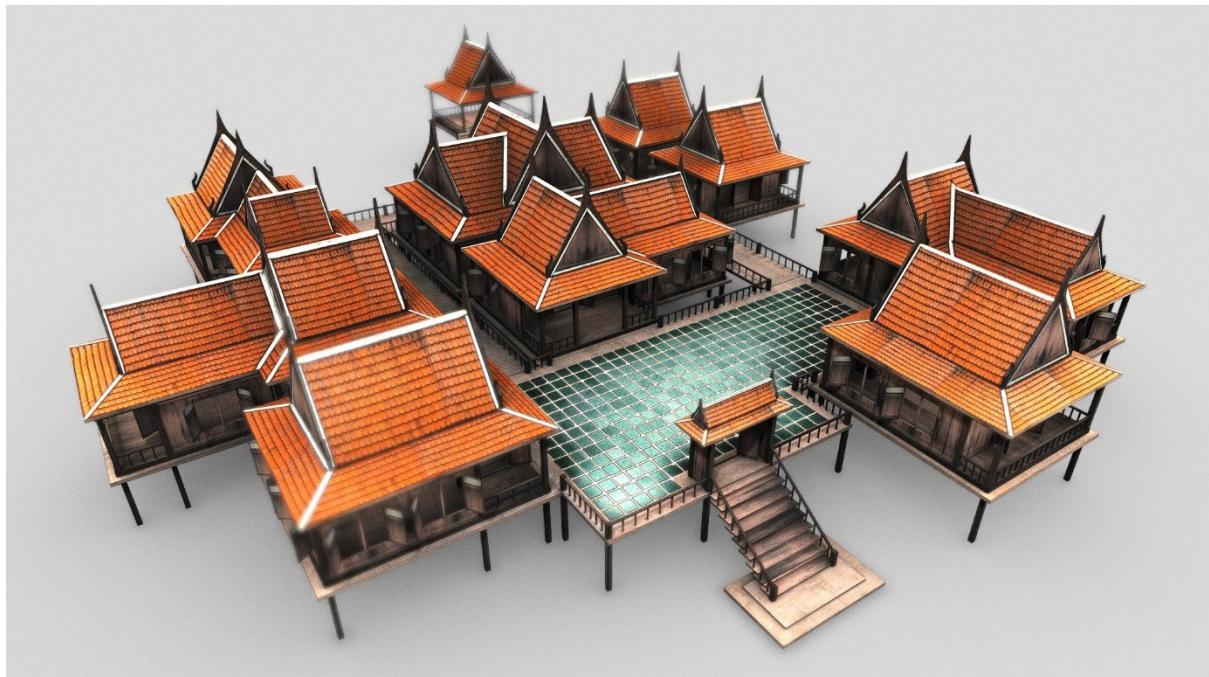


PARTS AND FEATURES OF TRADITIONAL THAI HOUSES: DOUBLE GABLED ROOFS, TERRACES, GARDENS AND WOVEN-BAMBOO WALLS

PARTS AND FEATURES OF TRADITIONAL THAI HOUSES



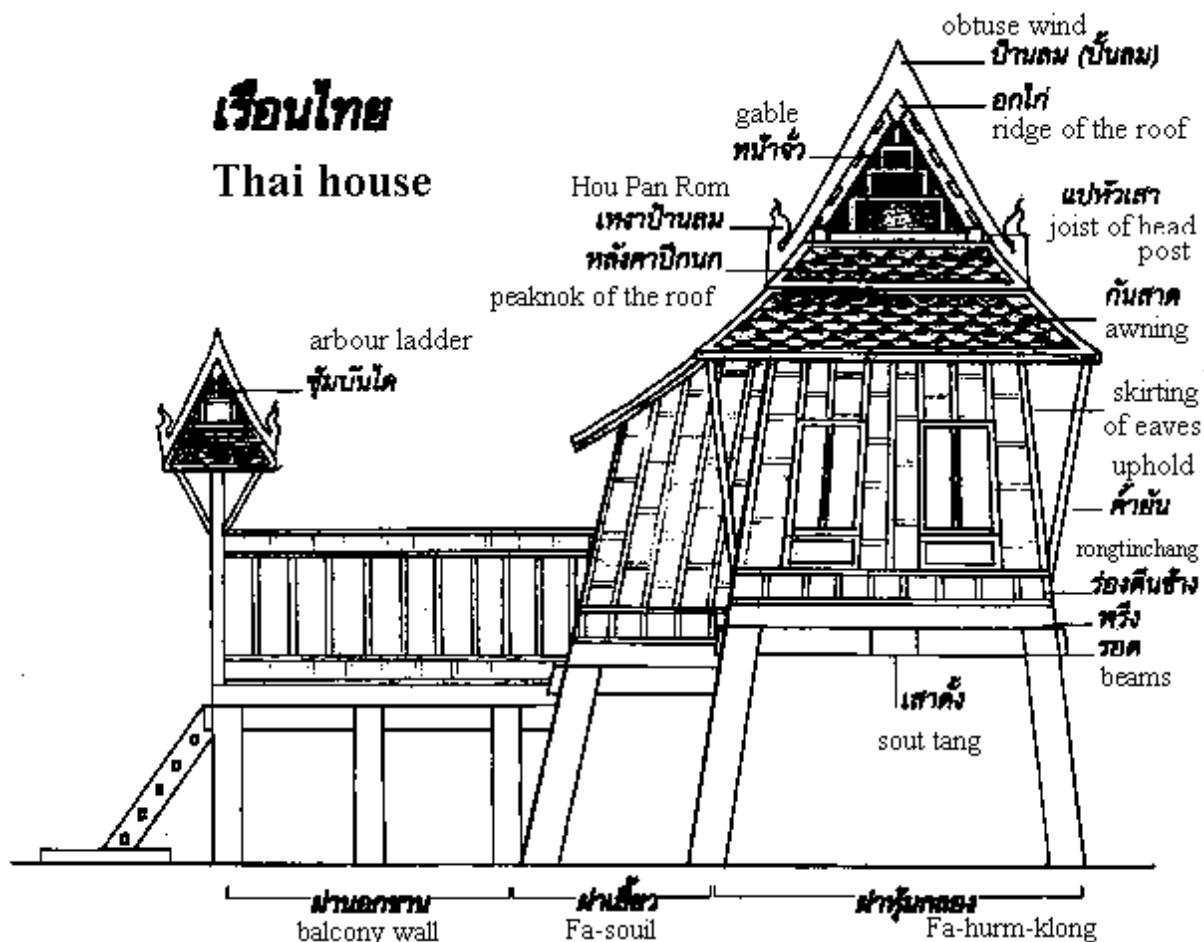
In his doctor's thesis on Thai Traditional Architecture, Wattana Boonjub wrote: "The classic wooden house of central Thailand has a distinctive elegance. It has a concave roof, arching bargeboards with hooked lower finials, and trapezoidal walls. These slopes and curving lines keep it from looking boxy. The house's adaptation to heavy rain and heat starts with the tall posts on which the structure is built. This is needed because central Thai villages are mostly built near rivers and canals, which are subject to flooding during the wet season that lasts from June to October. When the ground is dry, families use the sheltered area under the house, which is about 2 meters to 2.5 meters high, for making crafts, storing tools or raising poultry. [Source: Wattana Boonjub, The Study of Thai Traditional Architecture as a Resource for Contemporary Building Design in Thailand, a Thesis for the Degree Doctor of Philosophy, Program of Architectural Heritage Management and Tourism (International Program), Silpakorn University]

The curve of the steep roof is highlighted by a bowed plank called a bargeboard, or panlom, placed at the gable rims to protect the thatch roof tiles from wind. The lower ends of the bargeboards are carved in a horn-like shape called ngao.

Columns and walls are built leaning inwards, adding structural strength. Windows are tall and wide, for optimum ventilation; their shape mirrors the trapezoid of the cabin all panels. Skilled carpenters pre-assemble the wall panels in a standardized, modular system that allows them to be used interchangeably in any Thai house. The rooms open onto covered verandahs about 2 meters wide, which step down onto a broad wooden terrace.

Elements of Thai houses and residential buildings include: 1) Detached buildings with open-air walkways, often conforming with traditional landscape. 2) Walkways with roofed walkways ("muk krasan") provides protection from rain and sunlight like the type often seen at temples and palaces. 3) Terraces (chaan) are normally connected with a verandah.

Roofs on a Thai House



<https://www.oocities.org/RainForest/7153/bangsai3.htm>

The Roof, with distinctive characteristics, Wattana Boonjub wrote: "is the most unique part of Thai architecture. It protects the structure from the sun and rain. Typical roofing materials are terra cotta tiles, teak shingles, corrugated iron,

palm leaf thatch, teak wood chip, dried nipa palm leaves and dried grasses like vetiver.” The height of the roof not only protects against the rain but helps keeping the interior cool. Since the house has no ceiling, the large roof cavity allows hot air to rise up through the eaves. [Op. Cit, Wattana Boonjub]

Regional designs vary according to different weather conditions and cultures. Cooler weather in the north requires the roof to dip lower to the same level of the windows and the roof is not concave. Roofs of homes in the south, where the monsoon season is long, are large and steep in order to cope with heavy rains and winds. The aridity of the northeast causes the roofs have relatively gentle slope.



Northern Thai Traditional House
<https://www.tour-bangkok-legacies.com/traditional-thai-houses.html>



Southern Thai Traditional House
<https://www.baanjomyut.com/library/thaihouse/04.html>



North-eastern Thai Traditional House
<https://sites.google.com/site/3552momo/phak-h-xisan>



Central Thai Traditional House
http://bansongthaistyle.blogspot.com/p/blog-page_19.html

The main decorative feature of the house roof in central Siamese is the bargeboard, or panlom, which is a long, thin board attached along the projecting edge of a roof in front of a gable. Practically, it protects the exposed end of the roof tiles at the gable from the wind. At the same time, it is a decorative part of the roof with its ornately carving design that accentuates the roof height, steepness and shape.

Gabled Roofs and Hipped Roofs on Thai Houses



<https://www.dreamstime.com/photos-images/gable-roof-thai-house.html>

The gable roof is obviously Thailand's traditional roof form. It is built with a steep concave shape in the central region, where total rainfall during the wettest month, September, exceeds 30 centimeters - most of which comes in a daily torrent lasting an hour or less. The concave shape helps the house cope well with this heavy rain, sluicing down and shooting it out past the walls to prevent it from seeping through the roof covering. Additional rain and sun protection is provided by a short eave below the main roof on two or all four sides extending about 40 centimeters from the wall. One or more sides of the house may also, or instead, feature longer kansaad eaves supported by brackets. [Op. Cit, Wattana Boonjub]

Although gable roofs are prevalent, hipped and hipped-gable roofs can also be found in Thailand, reflecting the Malay, colonial and Western influences. The hipped roof, which is known for better drainage, is called panya in Thai. It is visible at some Thai Muslim houses in the south, where the roof is a lima roof - a Malay term derived from the Arabic word for five, referring to the roof's five ridges. Some experts believe that this roof form was introduced by British and Dutch colonials who lived in the Malay Archipelago from the 17th century onwards. Hipped roofs also appear on some houses and buildings built in the Sino-Portuguese style by Straits Chinese immigrants.

Hipped roofs were used in many royal residences, government buildings and mansions built in different European styles during the reigns of King Rama IV, V and VI (see 8.5 Western-Style Palaces and Mansions). These buildings display strong influence by Western architecture, which differ from the Sino-Portuguese style in the south. They have helped to popularize the hipped roof form throughout Thailand over the past 100 years.

The hipped-gable roof and gambrel or Manila roof commonly seen at Thai Muslim homes in the south combine the hipped form with gables midway up the slope on two or more sides. It helps to improve the ventilation of the house, in addition to the 109 drainage advantage of the hipped roof. It is known in Thailand as a blanor roof. The word is derived from an Indonesian word referring to the Dutch, thus reflecting the colonial origin. This roof form has started to appear atop several palaces and mansions in Bangkok during the late 19th and early 20th centuries and become popular ever since.

Double Gabled Roofs in Thailand



<https://www.dreamstime.com/photos-images/gable-roof-thai-house.html>

Langkha song chua” (double gabled roofs), also known in Thai as Manila style roof, places two separate gable roofs on top of the house. The extended part from the roof provides better protection to the structure. Nor Na Paknam pointed out that the extended concave part commonly seen at ubosot, viharn, or house helped prevent the rain from getting into the window or ventilation channel. [Op. Cit, Wattana Boonjub]

The blanor form of roof is influenced by Indonesian architecture and popular in the south of Thailand. The word "Blanor" is the term Muslim Thais used to refer to Dutch people. Some studies said the roof was of hipped panya type with added chua to better protect the structure, particularly both ends of the roof, from the rain. The blanor roof is a combination between Thai chua (gable) roof and western panya hipped roof. Muslim Thais call this combined architectural style "portong blanor", which is shortened for blanor. Houses with this style of roof are also popular among Buddhist Thais, especially those living in the lower south. Therefore, gable, hipped and blanor roofs (very popular) are the main forms of roof in this region. However, roof details may vary, like the roof called takatan (grasshopper), depending on the creativity of constructors.

The “langkha song chua manila” with extended eaves is a type of the roof that can be found in any area, but mostly it is found in the southern region. The construction of this roof is to suit the region's wet season, which lasts longer

than other regions. Therefore, the added eaves are the unique characteristic of houses in this region.

“Langka song chua” with double-deck eaves and kawsong is the type of roof for large building in Xishuangbanna in the south of China. It has traditionally served as the residence of the Xishuangbanna ruler. In "Art Dictionary," Nor Na Paknam defined khum as "a house, mansion or residence of royal rulers in the north. A study of Tai architecture by Onsiri Panond refers to "tua haw chao muang," which means a small, wooden structure in Tai style built in the form of the shrine with gable roof, double kaw song and sam tab.

A study of Wanida Puengsunthorn indicates that houses of ethnic Tai Lue have a distinctive roof and an architectural form that differs in each city. They include: A house with straight, upright walls, or ruen faa trong, with one-layered roof. This style of house can be found in Ban Thin, Muang Chiang Lan and downtown Chiang Rung in the south of China.

The raised part, or "kaw song," allows the house to have maximum ventilation and light. It also serves as an open duct for the house owner to look through around the house while the lower layer is very low, covering the upper part of the walls. This form of architecture is popular in Xishuangbanna including Jiangpom Village, Kwangluang Village, and Luantian Village.

The double-layered kaw song roof is the unique style of Xishuangbanna house with an aim to maximise ventilation and light. Ruethai Chongchairak who studies Thai-style houses, points out that kaw song is the upper part on the wall. It is located about 1 sawk or 50 centimeters lower than the pillar's top or beam. It features square chong luk faks around the house. In the Art Dictionary, Nor Na Paknam explains that kaw song is a wide and long wooden plank that is placed in the area connecting the roof layers. The preaching hall (sala kan parian) of some temples has murals, depicting jataka (the Lord Buddha's story) on kaw song. Nor Na Paknam defines "chaturamuk" in Art Dictionary as a cross-shaped, four-gable top pavilion. Prasat Chaturamuk is a building with four "muks" or terraces.

Roof Characteristics and Materials



<http://www.pattaya-location-beach-front.com/anmaison.php>

A roof that has added or dented layers can be found mostly in religious buildings such as a temple, bot, and viharn. This is a technique applied by craftsmen to create the sense of lightness and to reduce bulky look of the roof. Chote Kalayanamit says the use of multi-tiered roof can create the lightness for large buildings. Without multi tiers, such large structure will look bulky and heavy. [Op. Cit, Wattana Boonjub]

The space between each layer is different. The roof tiers are closer to each other at the lower part of the roof and become wider and wider at the upper part toward the top. Apart from that, the end of the roof that rises toward the sky also creates the light feeling. The extended part of the roof, which is found in traditional architecture, is suitable for buildings during the wet season. Nukul Chompoonit says the fully extended part of the roof is a unique architectural style of the country in tropical climate.

Slightly extended roof can be found mostly in religious buildings like bot and viharn in the Sukhothai period. With such feature, extra pillars or kun tuay or tuay hoo chang like that of the Lanna-style architecture is not necessary. Some temples in the early Ayutthaya period also shared this feature.

On roof materials, Ruethai Chaichongrak, who studies houses in the central plains says earthenware ceramic tiles, made from baked mud, vary in designs and sizes. They are named after their features like krabueng hangmon (tiles with curved end), krabueng hangtad (tiles with sharply-cut end) and krabueng khaw (tiles with bended form). With male and female gender, most are measured 0.05-0.08 centimeters wide. Materials for the tiles are plentiful across the country. Earthenware tiles called mung dinkhaw in northern dialect were used in the Ayutthaya period.

Teak shingles or paen kled mai sak Shingles or paen kled for roof is the main feature of houses in the north of Thailand. Ruen kalae, a twin or a group of buildings attached together, is built from teak wood. It has high gable roofs with large eaves levelled with the windows. The roof tiles can be made either of

earthenware or wood chips. Built on posts, the open space beneath the house is so tall that people can walk through the house without bending their backs. The house has one large hall-like room. It can be said that the use of earthenware or wood chip tiles is the characteristic that reflects Thainess.

Roof tile colours can come from the original colours of the material or their enamel. There are some typical tile colours as follows: Red. It is a colour of earthenware that is made from red-colour mud. It can be found in traditional visual arts. The name is derived from the materials like see din daeng or colour of red mud. Brown is the colour of the roof of such structures like bot, viharn and sala karn parian. In Ayutthaya period, the roof had gender, male and female called krabueng kabu. Initially, the roof tiles were not enamelled until the reign of Phra Phetraja during the construction of Wat Borom Buddharam, with Muen Chandra doing the enamel work. Other temples with enamel tiles are Wat Dusit near Wat Raerai in Ayutthaya. Green is the colour from the earthenware enamel.

Decorations on a Thai House



<https://www.pinterest.com/ORANGIPATTA/thai-traditional-house/>

Wattana Boonjub wrote: In a timber house, panlom is made of a wooden board about 3 centimeters thick. It is cut at an acute angle on the top end, where it joins its pair at the gable's peak. At its lower end, the bargeboard may be carved into a curved figure called tua ngao. The most common figure is "ngao", a stylized naga head that looks like a hook or a fin pointing up towards the top of the gable. Alternatively, panlom can come in a form of a fish tail, called "hang pla". This figure is more popular in the central and southern regions. [Op. Cit, Wattana Boonjub]

In northern Thailand, a fine house can be distinguished by crossed boards placed at the peak of panlom called "kalae". They can be made simply by extending the panlom boards or attaching two separate pieces of wood. The origin and the meaning of kalae have been widely debated. Some observers

believe it resembles water buffalo's horns, a symbol indicating that the household can or would like to afford plenty of livestock.

Southern people also decorate their houses with bargeboards with additional decorative wooden fretworks below the gable eaves as well as gable-peak finials of metal, stucco, or turned or fretted wood. In northeastern houses, panlom is usually a plain board without a lower finial.

The pediments of common houses are called na chua . They cover the gable ends of the roof to protect the interior from the sun, wind and rain. Usually made of wood, na chua can be built in any one of several styles common to the central region and elsewhere. The most popular style is the rectangular frame pattern called chua luk fak pakon, which is the same style as the wall panel called fa pakon. On the pediment, the panels create a kind of pyramid design: a row of rectangles at the base narrow to just one at the top. A pediment design often used in a kitchen is called chua bai prue, which is made of horizontal slats with openings for ventilation. The style is similar to louver doors. Another popular style of the pediment in the kitchen is chua phra athit or a sunray design. It comprises chua luk fak motif at the bottom end and a set of wooden 110 slats cut and placed with gaps in between on the top part in a semi-elliptical form, imitating the sun and its ray.

Parts of a Thai House

The virtue of the interior of a traditional timber house is its simplicity: the beauty of unpainted wood, and the versatility of open, uncluttered space. Rooms are mainly used for slumber, so loose furniture is limited to cupboards and boxes for storage, and perhaps a small low table and cushions. Since the house normally has no ceiling, it helps reduce the weight on the posts and make the underside of the roof easy for repair. The space under the roof is sometimes used for storage by placing bamboo poles across the pillars. [Op. Cit, Wattana Boonjub]

The cabin may be partitioned into rooms by wooden or woven walls. The floor plan is simple, either a single room or one room bisected, not structured with hallways. In a cabin with two rooms, the larger one might be used as a sleeping area, while the smaller one is filled with Buddha images placed on altars. The family's unmarried daughters always take the innermost room. Bedding is aligned parallel to the narrow end of the cabin rather than along the length, which is associated with the alignment of a body in a coffin. The alignment must also allow occupants to sleep with their heads pointing north, south or

east, but not west. This direction is reserved for the dead whose body is always placed with its head facing west before cremation.

One cabin, or part of one, may be turned into a three-walled sitting room open on the verandah side. The kitchen or ho khrua is situated on the terrace in a separate cabin somewhat behind the main house, and is just two posts wide. It features walls and a floor with a ventilation grille at the pediment. Traditionally, Thai houses have no en suite bathrooms. Bathing was done right on the terrace using a vat of water and a ladle. Toilet facilities may be a chamber pot or a nearby field or canal.

One of the ingenuities of the Thai house is its fast and sturdy construction using modular wooden wall panels. Pre-assembled by carpenters, they are brought to the construction site and simply hoisted into place on the posts. This way, the house can be erected in a single day. Wooden fa wall panel forms are named according to the pattern formed by the boards called “fa pakon” – a pattern of a grid of tall rectangles commonly found in central Thailand.

The panels dismantle easily, allowing the house to be moved and reassembled elsewhere quickly. They can also be reused to build another house. The panels are attached to the posts and beams using joinery rather than nails. This technique makes a structure sturdy and flexible, particularly when the wood expands or contracts in response to the moisture or changes in temperature. The modules are made in different shapes for different parts of the house. In a central Siamese house, with walls and posts leaning towards the roof, panels on the narrow ends of the house have a tall trapezoid shape with a wide base and narrow top.

However, the panels of northern houses taper in the opposite direction. Walls stand straight in the northerners' houses because builders favour rectangular-shaped walls (square is considered inauspicious). There, the walls are generally not pre-assembled but simply nailed onto the posts horizontally in a pattern called fa kradan reab (panel of flat/smooth planks). Bamboo houses have pre-woven wall panels, which are believed to be the form that precedes and inspires the pre-fabricated panels of the wooden house. The interior walls of bamboo houses and some wooden houses are made of woven panels called fa samruad, featuring long, thin bamboo strips laced into a grid pattern.

Doors and Windows on a Thai House



<https://www.pinterest.co.uk/pin/572027590154409584/>

<https://www.pinterest.co.uk/pin/148759593912566350/>

Doors (pratoo) are usually just plain wooden panels. Some wealthy home owners may have their doors carved, painted or gilded. In the central region, the door's trapezoidal shape enhances the visual composition of the whole structure because it mirrors the wall and window shapes, narrowing from the base to the top. Each room has a single door of two tall panels. To bring good luck to the occupants, home owners believe house doors should be the width of three lengths of their foot, or four lengths for the gable-topped gate at the terrace entrance above the main stairs. Northern Thais believe a guardian spirit resides within the frame of the door, so they avoid stepping on the threshold, which is painted red for auspiciousness. [Op. Cit, Wattana Boonjub]

A central-style house door has four main components: frame, panels, mullion and twin bolt. The door frame is called a thoranee, formed by the horizontal parts. They correspond to a lintel and doorsill-wooden boards at the top and bottom that hold the dowels on which the vertical door panels swing. The thoranee is mounted on a high threshold to block the entry of animals and water. One has to step over the thoranee when entering or going out of the room. The door panels are called baan, usually made from teak to withstand the heat, the humidity and the attack of termites. One of the baan panels has a mullion, or ok lao, a narrow lip of wood fixed on the outside vertical edge to cover the gap when closed. Midway up the ok lao is a handle formed by a diamond-shaped block of wood, which, in refined homes, may have carved or painted designs. A wooden twin bolt called dan khuu is mounted on the inside.

The design of windows (naatang) in central Thailand is similar to doors in terms of both structure and mechanism. One window is built into each standard-size section of the wall panel between the columns, except along the verandah, where one or two doors are installed. A house with nine windows and doors is considered inauspicious because it corresponds to the nine openings of the

human body. The window usually has a single-bolt lock, or darn diao, and a wooden bolt at the base called kob that slots into the sill. The base of the window on the outside usually has a fixed panel of carved wood called yong. Though often purely ornamental, yongs are sometimes artistically perforated to provide ventilation.

Regional houses in the north, northeast and south often have other window types such as single-panel or balustrade windows that, when closing, use a hinged or sliding board on the inside. Windows in the north and northeast tend to be smaller and fewer.

Terraces (Chaan), Steps and Balustrades on Thai Houses



<https://www.thailandmagazine.com/jim-thompson-house/?lang=en>

Perhaps, the most important part of the house in central Thailand is its broad elevated wooden terrace or chaan. Connecting all the cabins, it is the largest part of the house, taking up about 40 percent of the floor plan or 60 percent if the verandahs in front of the cabins are included. Chaan is built about 40 centimeters lower than a verandah - a comfortable height for sitting. The gap between chaan and the verandah is often left open, which accounts for its Thai name of chong maew rod, meaning “a hole for cats” Indeed the gap serves as a ventilator that allows air beneath the house to come in. [Op. Cit, Wattana Boonjub]

Terraces (chaan) are normally connected with a verandah. Generally, A terrace takes up about 40 percent of the whole area. Such vast space is necessary for

houses in hot climate as it secures maximum ventilation. A place where family members gather for evening activities, terrace is normally connected with a verandah (rabiang or palai) and an interior area of the house. A terrace serves as a recreational area like a verandah. Normally, it is a place for some religious events such as tonsure, merit making and wedding because it is the main reception area of the house that can receive a number of guests. Some house owners grow perennial shady plants like jampee (*Michelia Lo ngifolia*), jackfruit, and mango trees, while others grow smaller decorative pot plants. Pet birds like dove, sarika and duwao are also common in many Thai houses.

Shaded by walls and roofs of the surrounding cabins, and ventilated by wooden balustrades, chaan becomes a comfortable multi-purpose space for dining, guest reception, handicraft making and other activities. Some house owners build a chaan around a big tall tree. Comparing to the minimal decoration of the house interior and the yard, the terrace is adorned with ceramic vats of ornamental fish and water lilies as well as potted plants. Birds may be kept in cages or, sometimes, a special pavilion called ho nok. A big house with three or five cabins can have a broad terrace and an open pavilion in the middle of the house called ho klang, which is used as a living room.

Certainly, stairs are an essential part of a stilt house. It helps prevent against theft and wild animals. A house with a large terrace may have fixed dogleg stairs at the entrance topped by a gable-roofed gate. A smaller, secondary stairway may be built at the rear of the terrace. Stairs and ladders are always built with an uneven number of steps - not including the landing - because even-numbered stairways are believed to be steps for ghosts.

Timber balustrades mark the border of the terrace, creating a sense of enclosure and serving as a ventilator. In addition to using elements that are sawn, turned or sometimes cut into fretwork designs, there are usually vertical load-bearing supports 113 placed every 1 meters or 2 meters along the line. Terrace balustrades in central Siamese houses often function as a wall. They are tall, with narrow rectangular wooden panels in the fa pakon style at the top, bottom and sometimes sides of the balustrade section. Balustrades and railings are seen at their most decorative in Lanna and Shan houses of the north, and Thai Muslim houses in the south.

Yards and Gardens of a Thai Houses



<http://www.jimthompsonhouse.com/the-thai-house/>

The traditional yard is a scrappy affair; the ground around the stilts is often just clay, packed hard by foot traffic. There might be a few bushes, chosen not for their beauty but their resistance to drought and floods. Some households keep potted plants, selected for their auspiciousness or fragrance rather than decorative qualities. Trees may stand around the yard, but their branches should not hang over the house, which is considered unlucky. There is an exception, though, for a shady tree, which is allowed to grow through an opening of the centre of the terrace. Other plants are grown in patch cooking. The kitchen garden (suan krua) consists of herbs and spices such as lemon grass, chili, galangal and garlic. Some houses have a section reserved for a medicinal herb garden (suan sa-mun-prai). [Op. Cit, Wattana Boonjub]

Fragrant flowers and plants found in the garden include ma-li (night blooming jasmine) and jam-pee or white champaka (*Michelia alba*), which is used to decorate ceremonial wreaths. The fast growing tree like banana is also the favourite in many Thai houses. Plants with auspicious names are also popular. Some Thais grow ma yom or gooseberry trees in the garden, hoping to be well liked by people. The tree's name 'ma yom' sounds similar to ni yom, which means 'popular' in Thai. If one wishes to show their authoritativeness, he will plant tamarind or ma kham since kham means 'authoritative'. A jack fruit tree (ka noon) is often grown at the back of the house for spiritual support. Its name 'noon' means 'support'. Certain trees are considered lucky when grown at the right points of the compass around the house, serving as a natural fence. Yards in the south and northeast are often not enclosed by a fence or wall since relatives tend to inhabit next door. Thus the residence, which is about 200 – 400 on average, often turns into an extended family compound.

As important as the yard itself is the space under the house, which is sheltered from the sun and rain. The area is used for resting, storage, family activities, a handicraft making unit, and even a small livestock farm.

Types of Wood and Materials Used to Build a Traditional Thai House

The sophistication of ruen khrueng sap or timber house reflects the abundance of many of the world's best types of wood in Thailand. The government's Forestry Organization has classified some 500 local species of trees for their commercial value. Until the mid 20th century, 80 percent of the country was covered in forests, making timber 114 the easiest choice when building permanent structures. However, these resources became so heavily exploited that logging was banned in 1989. During that time, Thailand lost more than 60 percent of its forests.

The most important wood is teak (*tectona grandis*) or locally known as mai sak. Perhaps the strongest wood in the world, it is noted for its capacity to withstand changes in the weather and season. Teak tree grows tall and straight, so it can be milled into a maximum amount of quality timber. The teak tree resin typically has an oil in its Galih (Cambium/heartwood) that is highly water resistant. This content alone can protect the teak from decay, insects, and bacteria. Teak houses can last up to 200 years. Thus it becomes an excellent choice for house builders. Another versatile wood is narra or pradu (*pterocarpus macrocarpus*). It is a hard, medium-weight timber with yellow coloration. Moderate in cost, it is used for structural elements, interior finish, paneling and furniture.

Several varieties of rosewood (*dalbergia*) are used in Thai architecture too. Siamese rosewood, or payung (*d. cochinchinensis*), is used in making Chinese style furniture, as is timeline, or ching chan (*d' dougnaiensis*), known as the 'king of wood'. Monkey pod tree, or maka mong (*afzelia xylocarpa*), is a strong, heavy wood used to make floors, stairs, furniture, beams, window and door frames, paneling and veneer. Malabar ironwood, or thakien thong (*hopea odorata*), is a large evergreen tree used widely in construction. Gurjan, of yang na (*dipterocarpus alatus*), is commonly used in structural elements, interiors, frames, furniture and plywood. [Op. Cit, Wattana Boonjub]

The primordial construction materials used in Thai houses in the past are thatch for the roof covering and bamboo for other elements. Bamboo is nature's gift to builders. It is fast growing, easily harvested, lightweight, strong and flexible. It is so versatile that one can build a house, or ruen khrueng phook, almost entirely from the bamboo alone. Some laymen build a bamboo house themselves without help from the craftsmen. Each part can be interlocked using joinery or bound together with fibers made from vines, palm leaves, rattan or crushed young bamboo stems. Bamboo can also be used in combination with wood, which will be reassigned to structural elements like posts and beams.

Of the world's 1,200 species of bamboo, about 60 types flourish in Thailand. Supplies of wild bamboo have been reduced by deforestation and mismanaged harvesting. Therefore, it is increasingly being cultivated. Harvested after two or three years, the stems are treated with heat, water or chemicals to protect against insects and fungus. To make furniture and parts of the house, builders can either use the whole 115 bamboo stems or cut them in half, quartered, or as fine as a string. Cut in half and flattened, bamboo strips can be bound together to make a bench or a floor.

Among grasses and tree leaves used as roof thatch, mangrove palm or nipa palm, locally called chak (*Nypa fruticans*) is the most popular. These palms grow along canals and riverbanks. Vetiver grass or ya-faek (*Vetiveria zizanioides*) also makes a good roofing material thanks to its waxy, water-resistant surface, pleasant aroma and resistance to insects. An architectural emblem of northern Thailand is the beautifully rustic thatch made from the huge leaves of a tree called long tung, a species of dipterocarpus related to yang, or gurjan. Other thatch materials include banana leaves, sago palm leaves (*Metroxylon saug*), sugar palm bark (*Arenga saccarifera*) and elephant grass (*Pennisetum purpureum*).

Construction of a Thai House

It requires two types of specialists to build a wooden Thai house; a master carpenter and a Brahmin priest or astrologer. The former is in charge of the construction while the latter help determine an auspicious construction time and the house location. [Op. Cit, Wattana Boonjub]

Construction starts at the builder's shop, where the components are prepared before they are transported to the site. Once an auspicious position for the house is selected, holes are dug for the posts and fitted with wooden bases to prevent it from sinking. A ceremony is then held when raising the first post to mark the beginning of the construction. It involves the monks chanting, the blessing of the post with lustral water and the placement of pieces of nine auspicious types of wood in the post hole.

The remaining posts are raised one by one, going in a clockwise direction. Next comes the construction of the roof elements, then walls and finally the floor. In the past, each element was traditionally joined by wooden pegs. Now metal bolts and nails are now often used. About a dozen workers are needed for the

construction. They could be volunteers from the neighborhood who will be supervised by the head carpenter. Nowadays it is usually done by paid workers.

Ritual aspects are as important and complex as the technical methods of the construction itself. A Post, for example, must not be oozing sap, and careful consideration is made to avoid certain types or positions of knots. Even the position in which the post is laid in the ground before being raised must follow guidelines determined by the month. Additional rules govern the size, proportions and materials of other components as well as the planting of trees in the yard.

Text Sources: *New York Times, Washington Post, Los Angeles Times, Times of London, Lonely Planet Guides, Library of Congress, Tourist Authority of Thailand, Thailand Foreign Office, The Government Public Relations Department, CIA World Factbook, Compton's Encyclopedia, The Guardian, National Geographic, Smithsonian magazine, The New Yorker, Time, Newsweek, Reuters, AP, AFP, Wall Street Journal, The Atlantic Monthly, The Economist, Global Viewpoint (Christian Science Monitor), Foreign Policy, Wikipedia, BBC, CNN, NBC News, Fox News and various books and other publications.*

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