

The Sustainable Homeland

"2018 Taichung World Flora Exposition" (2018/11/03-2019/04/28) aims at inviting people from all over the world to reflect on the relationship between humans and nature, to listen to the message passed from nature, and to take care of our land and nature.


Industrial civilization advances with the times, resulting in many vigorous conflicts that damaged natural resources. Modern lifestyle and urban development have been constantly destroying nature. Green spaces disappear, Rivers and Ocean are polluted. Human activities are murdering the only planet where all the creatures rely on. How can human lifestyle change? How to solve the problems of climate change and environmental pollution and make the earth sustainable? This is the urgent issue that all mankind must face.

The project is at the main location in the Forest Park Area as the demonstration of the sustainable homeland. Derived from the most basic needs of human – food and houses, we proposed a possible sustainable lifestyle which re-connects human with nature.

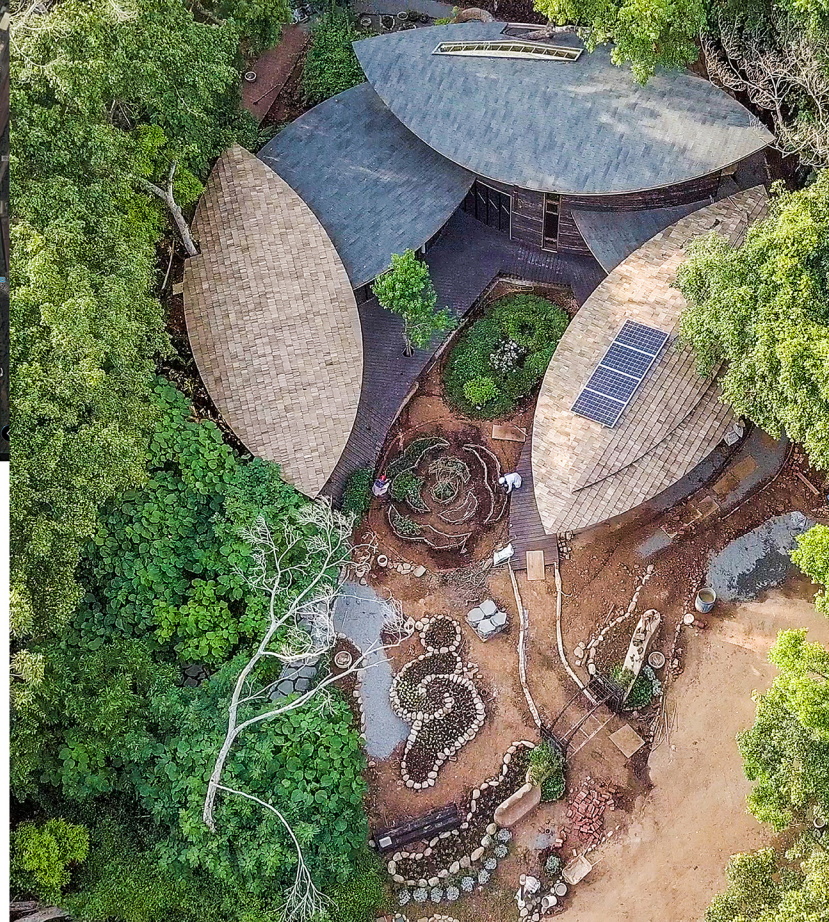
The Core of Home

The functions of houses vary from the basic ones such as shelter provision, external defense and security protection to the pursuit of wealth or the exploitation of natural resources for human desire. All these functions seem to indicate that the core of home is human beings. However, the belief of anthropocentrism makes us forget the truth that humans are still part of nature. Without Mother Nature, humans would not survive. If we adopt a broader perspective to see the house of all human beings, the house of all creatures, we will come to realize that our planet, though already full of scars, is what we should protect. Mother Nature is the true core of the sustainable homeland.

In order to raise public awareness and understanding to nature, we placed nature at the center in the house, while the living space surrounded it to form a subordination relation. The core of sustainable homeland is nature, which are the land that feeds us, the plants, the animals, the creatures, the light, the sounds, the wind, the rain, the change of four seasons, the time and the spirit. The living space surrounds the internal nature, and it is surrounded by the external nature at the same time. The internal nature is constantly perceived, paid attention to, taken care of, and learned; and human beings are inspired by this.



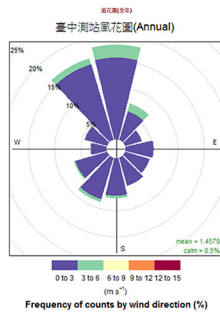
Steering the wheel of sustainability back to the beautiful planet where human and nature coexist in harmony.



The Site

The site of the project is located in the Forest Park Area of "2018 Taichung World Flora Exposition" in Houli District, Taichung City, Taiwan. The land was originally for military use in the past and it is rich in forest resources. Located in the zone of subtropical climate, the site is characterized by hot and humid summers, drought winter, the annual average rainfall of 1300~1500 mm, the annual average temperature of 22.1 Celsius degrees, which is suitable for crop production. The primary wind direction is north wind and north-northeast wind. The building lot of the project covers an area of 0.2 hectares and is located at the main location of the park. The original look of the site was covered by the natural succession of wild forest and surrounded by the big, old trees.

The natural space created by the forest is gradually lifting from south to north, which exactly blocks the north wind in winter and greets the warm sunshine from the south. The height and the structure of the building conform to the landform and the monsoon. The terrain is high in the north and low in the South, so we put the entrance at the south side. In order to allow the original trees to naturally grow and maintain the function of carbon fixation, the layout of the building and the two eaves are receding to avoid infringing on the space of nature, showing our respect and cherish of nature.



Natural materials, low carbon design

Natural materials, extremely low carbon footprint, recyclable, minimal waste.

All-wood structure system: The amount of fixed CO₂ is about 33 metric tons as the positive effect of reversing global warming effect.

Domestic materials: Actively using domestic cedar and acacia, promoting and revitalizing the wood industry in Taiwan through produced and purchased locally.

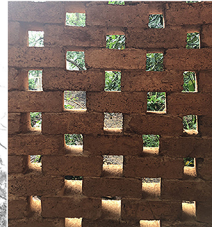
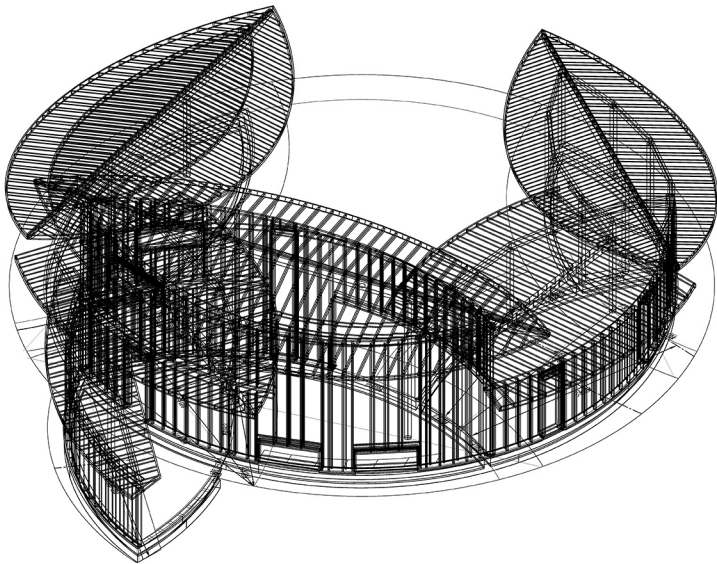
Precast Wall: The construction can be precise and fast, effectively shortening the construction period. The rice stalk bundle (agricultural waste) is used as filling for its high performance of heat insulation.

Earthen Plasters: Adjusting moisture, fire and heat insulation, and gentle texture.

Adobe bricks: The screen for light and shadow interpretation, local materials, zero waste. After removed, it can return to the soil.

Charred cedar cladding (Shou Sugi Ban) Shingles: Organic lines, ancient wisdom, weather resistance method, non-toxic and durable.

Certified as "Diamond Grade Low Carbon Building" by the Low Carbon Building Alliance (LCBA) s "BCF System for Completed Projects, BCFc"







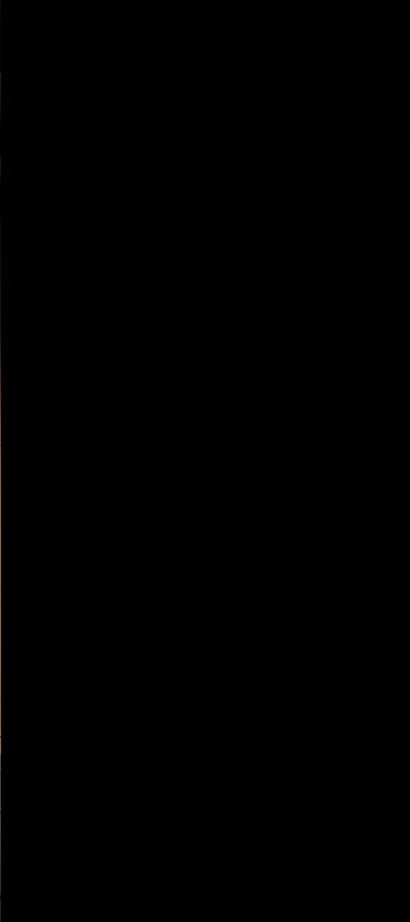












Program

The project is the demonstration of a sustainable house. Including the surrounding hinterland, it serves as a four-person living area. We put the curatorial items into the corresponding spaces.

The organic edible garden is placed in the center. Each living space is located at a corresponding place according to their attributes and usage time. Conforming to the landform and climate, each space is also corresponding with a low or high rooftop, showing a lively and light roof line just as fallen leaves.

The introduction of each space is as below.

() refers to the state when the exhibition area is under use

L02 Exhibition area: Entry.

Enter into the path at the south side, along with the curved wall you'll be led to the entry with a green wall. Here, the illuminance is reduced by the low ceiling, creating a buffer space for mood changes.

L01 Exhibition area: Bedroom (the project of sustainable construction and equipment display).

For resting and sleeping, low illumination. It is arranged on the east side, so you can wake up in the morning by the natural sunshine. In response to the extreme climate, we adopted the high-performance housing design with good heat insulation and air tightness. The air change system is also embedded in the floor, offering a satisfying indoor air quality.

L03 Exhibition area: Living room /mezzanine as child room (or office).

For static activity use, moderate illumination, vertical upward space, high ceiling with natural lighting to the north wall. The light and shadow move over time.

L04 Exhibition area: Restaurant and Kitchen (accommodate 30-50 people for lectures and talks).

The multi-functional space with the low, horizontally-extending ceiling. The floor-to-ceiling windows can be fully opened in comfortable weather, turning the room into a semi-outdoor space. The room connects L03 and L05 and extends to the atrium. Open to nature, it can accommodate the different amount of people. During the lectures, visitors are free to participate or leave.

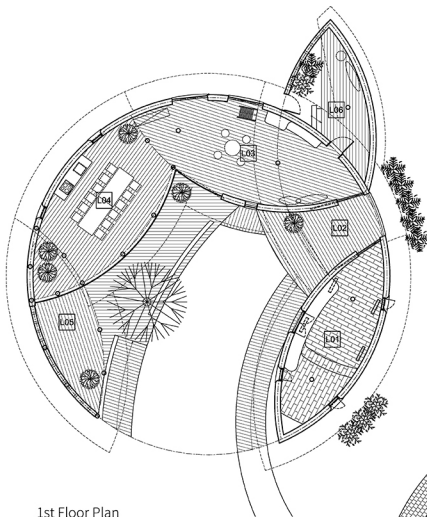
L05 Exhibition area: Outdoor kitchen and Arbour.

A well-ventilated space to rest, with an earthen oven and hammock.

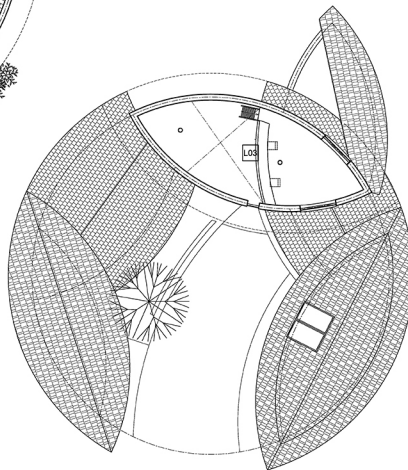
L06 Exhibition area: Bathroom and Toilet (Lecturer lounge).

Semi-open-air space with a bathtub and a bio-toilet. When you look up, you can see the branches and leaves swaying. Through the hollow brick walls, you can also enjoy the light and shadow moving. It can serve as a space for meditation.

Atrium terrace: Through the shaping of the buildings, it forms an outdoor terrace with a comfortable micro-climate.



1st Floor Plan



2nd Floor Plan

The Circle

The project strengthens the inner natural power through a circular layout. The characteristics are as follows:

Cohesion: Due to the centripetal force generated by the circular wall, in the primary living space, human behaviors will naturally face toward center, which helps strengthen the sensitivity of things happened in the circle; for example, the perception of crops and plants growth, the perception of meteorology, the perception of family activities and the perception of a sense of security.

Defense: The defense of the threat from the external, the shelter from the wind and rain. A sense of security is enhanced.

Construction: The radius of curvature of the wall is uniform. It reduced potential error occurred in the period of layout and construction and thus ensuring that the project can be completed on schedule.

Mobility: The interlaced curve and the space of flows enhance a vivid effect in the house.

Mystery: The circular house hidden in the forest triggers visitors' curiosity and get them involved.

Passive Design ; Zero Net Carbon Emissions

Orientation: A twist on south facing san-ho-yuan. It blocks the north winds and greets the sunshine from the south.

L01 Exhibition Space: The high-performance of housing design, the heat-proof and humidity-adaption exterior wall, the heat-insulated rooftop and window. Utilizing ground temperature for air change to ensure good indoor air quality. Cool in summer and warm in winter.

L03 Exhibition Space: The high ceiling helps the gravitational ventilation. The north side window introduces cool air in summer.

The extending eaves provide shade and a shelter from the rain.

The edible climbing plants landscape shades east and west exposures.

Indoor plants: Purify the air quality and absorb dust.

Solar panels: Energy self-sufficiency.

永續之輪

手掌永續的舵輪，航返共生共榮的美麗星球。 永續家園 「2018 台中世界花卉博覽會」 (展期 2018/11/03~2019/04/28) 主軸為邀請世界民眾一起反思人類與大自然的關係，用心傾聽大自然欲傳達的訊息，關懷土地與自然。 工業文明的與時俱進，存在著破壞大自然的劇烈衝突問題；工業生活方式與都市發展的模式，一直不停地扼殺大自然，讓綠地消失，讓河川海洋汙染；人類活動正在消滅萬物賴以為生的唯一的星球。 人類生活該如何改變？如何解決氣候變遷與環境污染而讓地球永續？是全人類所必須共同面對的迫切的議題。 本案位於森林園區樞紐位置，作為永續家園的展示。從人類生活最基本的「飲食與住居」提出一個可能的永續生活方案，試圖重新連結與大自然的關係並與之平衡共生。 基地：Site 基地位於台灣台中市后里區之「2018 台中世界花卉博覽會」森林園區內，原為軍營用地，樹木資源豐富。屬亞熱帶氣候，夏季高溫多濕，冬季乾旱，年平均降雨量 1300~1500 毫米，年平均溫度 22.1 度，適宜農作生產。主要風向為北風及北北東風。本案建築基地面積 0.2 公頃，位於園區樞紐位置，原貌為自然演替被大樹環繞之野草林狀態。被大樹圍塑的空間感由南向北漸高，正好抵禦冬季北風，迎接南向暖陽。建築物高度與配置順應地貌與季風，北高南低，入口由南側進入。 為使現場原生大樹皆能維持生長及發揮固碳效應，建築物之平面配置及兩處屋簷皆退讓使閃避之，顯示對自然的崇敬與珍惜。 設計理念：Concept 家庭農業 「民以食為天，食以安為先。」以經濟導向的現代大規模農業已造成許多食安及環境問題，並且造成土地養分消耗殆盡，必須施以更多肥料，形成惡性的循環。而家庭小型農業可以確保安全的食材，以不破壞自然循環再生、不翻耕的友善耕作方式，在林間混養耕作，以達最小食物里程；並透過廚餘堆肥及中水過濾香蕉圈等再利用方式，建構有機物的小型循環。 家的核心 家屋的功能從最基本的遮風擋雨、抵禦外界威脅、保障人生安全，一直到追求富足、滿足慾望的自然資源消耗，一再顯示家的核心是人。但這樣的人類本位主義思想讓我們忘記了人也是大自然的產物；沒有了大地母親，人類也將無法生存。若提升高度來看待全人類的家、萬物的家，會發現這顆傷痕累累的星球才是我們該保護的；大自然才應該是永續家園的核心。 為了喚起大眾對大自然的認知及重視，將自然配置於家屋的中心位置，生活空間環繞在側，形成一個主從關係。 永續家園的核心是自然，是供養我們食物的土地，是植物，是動物，是生物；是光，是音，是風，是雨；是四季更迭，是時間，是精神。生活空間環繞在側，介於兩個自然之間，內建的自然被時常感知著、被關注著、被照顧著、被學習著；人類被啟發著。 圓 Circle 本案以圓形平面來強化內在自然的力量，其特點如下： 內聚性：主要的生活空間皆因圓弧牆面產生的向心力，讓人的行為自然而面向中庭，有助於加強對圓內的感知力；如植物農作生長的感知、氣象的感知、家人活動的感知以及安心感。 防禦性：對外週威脅的防犯、風雨遮蔽，以提升安全感。 結構性：型抗結構有助分散化解地震力及風力。 施工性：牆體曲率半徑統一，減少放樣及施工出錯率，確保能如期完工。 流動性：曲面交錯、空間流動，空間趣味性提升 神秘感：一棟隱藏在密林間的圓形房子，引發遊客想一探究竟的好奇心。 空間計畫：Program 展館本身為一永續住居的展示，與周圍腹地合為一家四口的生活場域。並將策展項目置入相應的空間當中。 有機飲食花園置於中心，各生活空間依屬性及使用時段，順應地貌及氣候，配置在適宜的方位，並設定相應的空間高度，形成高低錯落猶如散落的葉片，呈現活潑輕盈的屋頂。

The Wheel

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The project is at the main location in the Forest Park Area as the demonstration of the sustainable homeland. Derived from the most basic needs of human – food and houses, we proposed a possible sustainable lifestyle which re-connects human with nature. The Site The site of the project is located in the Forest Park Area of "2018 Taichung World Flora Exposition" in Houli District, Taichung City, Taiwan. The land was originally for military use in the past and it is rich in forest resources. Located in the zone of subtropical climate, the site is characterized by hot and humid summers, drought winter, the annual average rainfall of 1300~1500 mm, the annual average temperature of 22.1 Celsius degrees, which is suitable for crop production. The primary wind direction is north wind and north-northeast wind. The building lot of the project covers an area of 0.2 hectares and is located at the main location of the park. The original look of the site was covered by the natural succession of wild forest and surrounded by the big, old trees. The natural space created by the forest is gradually lifting from south to north, which exactly blocks the north wind in winter and greets the warm sunshine from the south. The height and the structure of the building conform to the landform and the monsoon. The terrain is high in the north and low in the South, so we put the entrance at the south side. In order to allow the original trees to naturally grow and maintain the function of carbon fixation, the layout of the building and the two eaves are receding to avoid infringing on the space of nature, showing our respect and cherish of nature. Design Concept Family Farming "Food is the paramount necessity of the people; and safety is the paramount importance to the food." The profit-oriented, modern large-scale farming system has brought about numerous food safety and environmental problems. It exploited the nutrition of the soil and made farmers have no choice but to apply more fertilizers to the fields, driving the vicious cycle. Whereas, Family Farming can ensure the production of safe food by utilizing the techniques such as ecological recycling agriculture, no-till farming, crop and livestock farming to achieve the shortest food miles. In the meanwhile, Family Farming can construct a small cycling system of organic matters through methods such as composting or applying banana circles (one of the permaculture techniques). The Core of Home The functions of houses vary from the basic ones such as shelter provision, external defense and security protection to the pursuit of wealth or the exploitation of natural resources for human desire. All these functions seem to indicate that the core of home is human beings. However, the belief of anthropocentrism makes us forget the truth that humans are still part of nature. Without Mother Nature, humans would not survive. 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The characteristics are as follows: Cohesion: Due to the centripetal force generated by the circular wall, in the primary living space, human behaviors will naturally face toward center, which helps strengthen the sensitivity of things happened in the circle; for example, the perception of crops and plants growth, the perception of meteorology, the perception of family activities and the perception of a sense of security. Defense: The defense of the threat from the external, the shelter from the wind and rain. A sense of security is enhanced. Construction: The radius of curvature of the wall is uniform. It reduced potential error occurred in the period of layout and construction and thus ensuring that the project can be completed on schedule. Mobility: The interlaced curve and the space of flows enhance a vivid effect in the house. Mystery: The circular house hidden in the forest triggers visitors' curiosity and get them involved. 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