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Delivering Social, Empathetic and Sustainable Architecture in Malaysia

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ABSTRACT

Architecture plays a crucial role in shaping societies and environments, with a growing focus on its relation to equity and ecology amid global challenges like climate change and social inequality.Kuee Architecture's work primarily focuses on creating inclusive communities that prioritise both people and the planet. The purpose of this paper is to study in depth, how each of their projects has considered some or all aspects of social, empathetic, and sustainable architecture. These projects will be explained in terms of their origins, design concepts and sustainability, before concluding on the positive impact each project has had on the community.Specific methods have been used for each project based on its relevance. More technical studies, such as daylight simulation studies, were applied to *Galasa Event Place,* where daylight was significant for the success of the project in terms of sustainability. Whereas for *Pasar Pasir Pinji,* detailed information on public engagement is provided to highlight the importance of stakeholder involvement in social architecture. Empathetic architecture was the main driver for the *KLS Crematorium,* as demonstrated by the careful and intricate design of the various spaces and the sequence of spaces for the mourning. *1 Lasam,* a multiple award-winning project that was also included in the UIA 2030 Agenda, is the final project discussed. The success of all the applied aspects of social, empathetic, and sustainable architecture are demonstrated through the post-occupation surveys, its popularity among the community, and the efficiency of the building

1. Introduction

Architecture plays a crucial role in shaping societies and environments, with a growing focus on its relation to equity and ecology amid global challenges like climate change and social inequality. Exemplary architecture should, to a certain extent, embrace social, empathetic, and sustainable principles in order to be successful in the long run.

Social Architecture is a term that generalises community architecture and planning, community design, social design, democratic design, etc., all of which share a common approach to environmental design that encourages social behaviours[1] – a multidisciplinary approach to designing and shaping human societies. By integrating insights from sociology, psychology, anthropology, economics, design, and technology, we seek to create environments that promote social cohesion, equity, and the flourishing of all members of society.

Empathetic architecture, on the other hand, focuses more on a design approach that prioritises understanding and addressing the emotional and psychological needs of individuals within built environments. Instead of just focusing on aesthetic appeal, empathetic architecture places emphasis on creating spaces that resonate with human emotions, experiences and well-being. By prioritising empathy and responding to users' emotional and psychological needs, empathetic architecture has the potential to enhance the quality of life and well-being of individuals within a built environment.

Sustainable architecture prioritises environmental responsibility. The key aspects of sustainable architecture include energy efficiency, resource conservation, waste reduction, climate resilience, biophilic design, etc. By integrating environmental, social and economic considerations into the design process, sustainable architecture aims to create a resilient, healthy, and environmentally responsible built environment for present and future generations.

Kuee Architecture focuses on creating inclusive communities that prioritise both people and the planet. This paper aims to explore their body of work that demonstrates social, empathetic and sustainable architecture. Four projects will be studied in depth that embody one, two or all three of these aspects. There will also be examples that foster social cohesion through inclusive design, accessible amenities, and opportunities for community engagement, creating a vibrant and sustainable environment that prioritises the health and happiness of its users.

2. Project 1: Galasa Event Place *Ipoh, Perak, Malaysia*

2.1 Introduction

The Galasa Event Place was initially designed as a wedding hall. Measuring 2,200 square metres (indoor and outdoor combined), this 'glass box' set in a garden setting accommodates up to 1,000 people. Half of the site is covered with lush greenery, with ancillary spaces (such as the altar, orchid glass house and parlour) scattered around with adequate spacing in between. The altar is a floating platform above a tranquil pond – where vows are exchanged and group photos are taken, while the orchid glass house and parlour serve as pre-event or informal gathering spaces.

2.2 Genesis of the Project

The client, a successful entrepreneur, approached Kuee Architecture to conceive of a glass house to hold weddings and events. Having run a successful catering business for many years, the client sensed a shortage of multipurpose halls with a garden setting in the city, a place where people could host events both indoors and outdoors simultaneously. Albeit initially intended for commercial weddings, the venue's completion led to the decision to open it for non-profit events and gatherings.

2.3 Design Concept

A black building was designed based on the client's desire to go beyond a conventionally white theme typically associated with weddings. Looking at inspirational objects in weddings and events, Kuee Architecture adopted the black diamond as the design driver. By dismantling and disassembling the black diamond metaphorically and exploring the transmission of light in diamonds, a glass façade

with gradually unfolding pleated zigzag panels was formed. The façade was colour-coded with various tones of black, dark grey, opaque and clear glass panels, representing the different levels of light transmission.

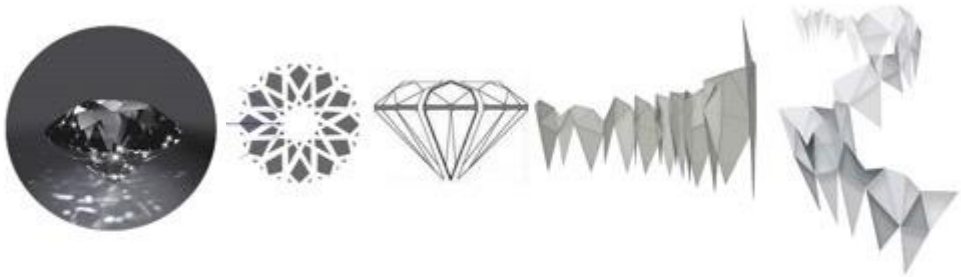

Fig. 1. The development of the design concept evolved from a black diamond to unfolded and pleated zigzag panels with variations of greys and opacities

2.3.1 Sustainability

The building was constructed with large-span I beams, with a column-free space created in the main hall to allow an unobstructed and spectacular gathering space underneath. The modular I beam structure allowed fabrication to be repetitive and speedy, which resulted in an extremely short construction period. It took exactly one year from inception to completion. The accelerated construction period resulted in lower carbon emissions, reduced labour and energy consumption, all of which contributed to a more sustainable building.

Fig. 2. Extensive green features have been applied to the project

Many approaches have been used to reduce the temperature in the garden area, such as the specially designed features that utilise evaporation to help cool down the surroundings. The abundance of greenery around the site has also significantly reduced the heat island effect. The types of plants were carefully chosen, with plants that contribute to high carbon sequestration, such as bamboo and *kayu arang,* being grown all around the boundary of the site. Rainwater harvesting tanks were installed towards the rear of the site, and most of the rainwater collected from the large metal roofing is used for landscape irrigation purposes.

To ensure comfort within the event hall, the most efficient roof insulation available on the market at that time was used – TH Superior Rib 35 (insulation 50mm thk) PU metal in Zincalume G27 T.C.T. 0.47 mm.

2.3.2 Daylight Simulation Studies

A glass hall is unusual in a Malaysian context. A study was carried out to simulate the indoor daylight conditions without any artificial lighting to determine how sunlight would interact with the glass facade. Working with an energy efficiency consultant using an Integrated Environmental Solutions Virtual Environment (IES-VE), building performance simulations were carried out using a 3D model.

Daylight simulations were conducted with an overcast and uniform external sky that has a constant 10,000 lux level. The results were measured using Daylight Factor (DF) – a parameter used to measure the reference point of available light indoors against the available light outdoors. An overcast sky condition was optimal for conducting the daylight simulations to ensure that a consistent DF reading could be obtained. Figure 3 shows the floor plan for the wedding hall, with the simulated zones highlighted in red. The total area for overall daylight results included the stage, backstage, control and audio visual (AV) rooms in the Net Lettable Area (NLA). These made up the total functional use areas for commercial purposes inside the building, excluding all common areas and service areas.

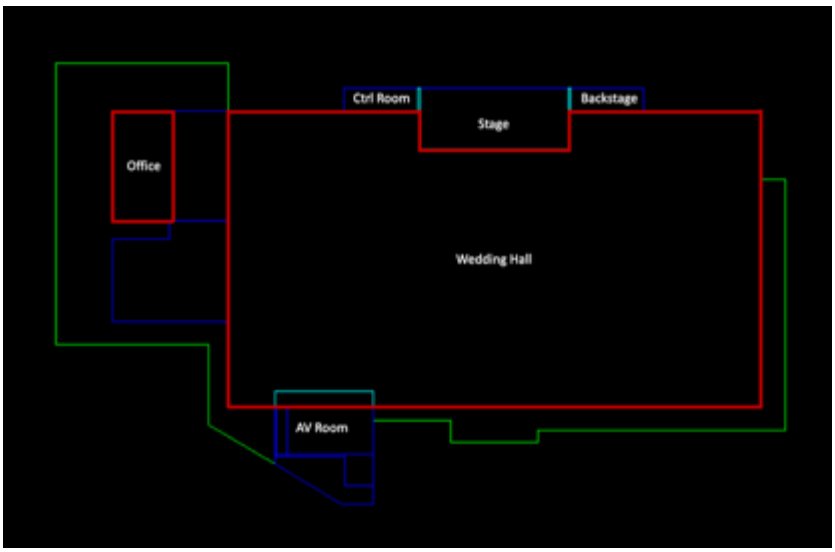

Figure 3: Floor plan for the wedding hall with the simulated areas highlighted

Glare simulations were conducted with sunny conditions for the external sky, as a sunny sky would be the worst-case scenario for the building, and the most likely source of glare for the occupants. Glare thresholds were based on the Green Building Index (GBI) EQ9 credit, where all glare above 2000 cd/m2 is considered uncomfortable for the occupants.

DF was measured at the working plane of 800 mm from floor level, with an acceptable DF range of 1.0 to 3.5%. This was based on MS 1525, the Malaysian Standard on energy efficiency and the use of renewable energy for non-residential buildings.

DF (%)	Lighting	Glare	Thermal comfort
> 6.0	Intolerable	Intolerable	Uncomfortable
3.5 - 6.0	Tolerable	Uncomfortable	Tolerable
1.0 - 3.5	Acceptable	Acceptable	Acceptable
< 1.0	Perceptible	Imperceptible	Acceptable

Table 1. Daylight Factors (DF) and impact of the different values. A DF of 1.0 – 3.5 is the optimal range that is acceptable for lighting levels, glare tolerance and thermal comfort

The results of the main hall area are shown below. The DF results were plotted on a 4 m by 4 m grid for the wedding hall, and the DF contour lines for the main hall shown in Figure 4 and Figure 5 respectively. Usable Daylight Area (UDA) is the total daylight area that falls in the DF range of 1.0–3.5%. The main hall was found to have a UDA of 438.21 square metres, which is 43% of the total hall area.

Figure 4: DF results for the main hall area plotted on a 4m x 4m grid & DF contour lines for the main hall area

2.3.3 Glare Simulation Results

The results of the glare simulations were analysed with GBI's EQ9 credit, Daylight Glare Control. The requirements for the building to reduce discomfort from glare from natural light were considered:

i. To eliminate glare from all direct sun penetration and keep the horizontal workspace luminance level below 2000 cd/m2
ii. To eliminate glare from diffused sky radiation for occupant workspaces at viewing angles of 15° to 60° from the horizontal at eye level (typically 1.2m from the floor level)
iii. To control with an automatic monitoring system (for atriums and windows with incident direct sun light only – not applicable for fixed blinds or screens)

The glare analysis was conducted on the east and west orientations of the highest occupied floor of the building with a sunny outdoor sky condition on the following days:

i. East Orientation: 21st June, 9:00 am
ii. West Orientation: 21st June, 5:00 pm

The results from the glare simulation analysis are shown below in Figure 5. There were no sources of glare for both orientations, with the highest glare values being below 600 and 700 cd/m2 for the east and west orientations, respectively. The low glare value – a result of the low VLT from the glazing – showed that there was no need for the installation of roller blinds or other glare prevention.

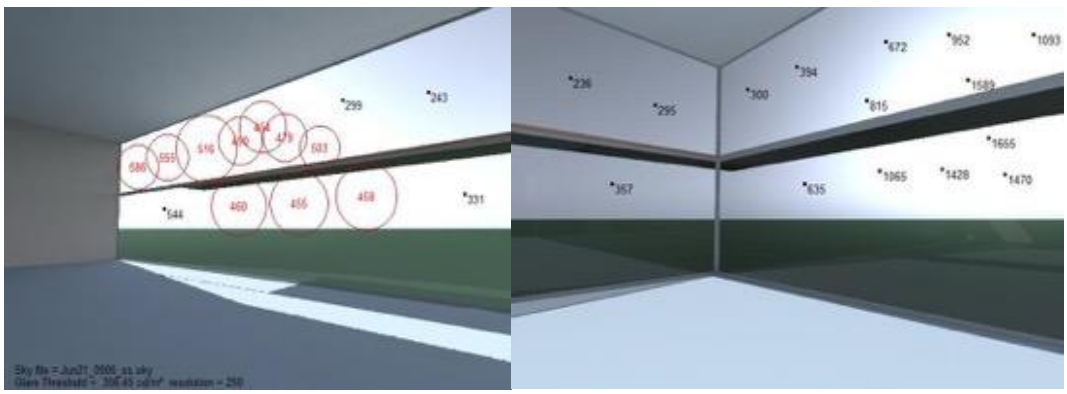

Fig. 5. East orientation glare analysis at 9:00 am on 21st June with no blinds installed (left) & west orientation glare analysis at 5:00 pm on 21st June with no blinds installed (right)

Both the daylight and glare simulation studies were critical in identifying the issues with the proposed building in relation to sustainability, particularly daylight. Based on the findings, low-E glass (10.76mm thick glass, composed of 4mm NHG Clear Annealed Glass + 0.38mm Grey PVB + 0.38mm White Translucent PVB + 6mm NHG SN Euro Grey Hard Coated Low-E #4 Annealed Glass) was used for the side facing the western sun to reduce penetration of heat into the space. The glass façade was also intentionally designed to be slanted vertically to provide self-shading from the sun. With all these strategies, radiant heat and the electricity required to cool the building mechanically were substantially reduced.

2.4 Impact on Community

> *"Architecture is not simply about space and form, but also about event, action, and what happens in space." – Bernard Tschumi, Architecture and Disjunction*

On a softer note, the function of the place was explored with an empathetic touch. Equitable architecture creates spaces accessible to all, fostering social cohesion across diverse communities.[2] The building's owner has been able to further exemplify this inclusivity by hosting various events and accommodating diverse guests. From charitable events patronised by the royal family, concerts by local and international artists to weddings of all races, many community and corporate events have been hosted here. The monochrome neutral setting, intentionally designed by Kuee Architecture, has proven to be extremely friendly to all, as it is easily adaptable to a diverse range of events and activities.

Children, the elderly and the disabled have all been given special consideration in the design. The building's step-free surroundings also further encourage social interaction among all walks of life. There are virtually no level differences in the entire site, with the exception of the grand entrance, where a separate ramp has been provided. To ensure that the grand entrance is private yet inviting, it has been raised less than 5 feet from the street level – referencing many social behaviour studies led by William Whyte[3]. This open environment also acts as a playground for adults and children alike. Various musical acts pop up every so often in the garden, and it is not uncommon to find children laying around on the turf as they wish.

The aspiration to 'design for all' has driven Kuee Architecture to inculcate a more inclusive spirit, which stems from their design philosophy that everyone should have the same opportunities and the privilege of enjoying good architecture regardless of their background.

Fig. 6. The Galasa Event Place hosts various formal and informal events for people from all walks of life

Fig. 7. The serenity of the Galasa Event Place when it was not in use

3. Project 2: Pasar Pasir Pinji (Pasir Pinji Wet Market) *Ipoh, Perak, Malaysia*

3.1 Introduction

Measuring about 3,000 square metres, the upcoming Pasir Pinji wet market is a double-storey building with a high ceiling and a sub-basement car park. It aims to be the first GreenRE[4] Silver rated wet market, and represents a bold take on public buildings with strong community-centric driven input. The project is expected to be completed by 2026.

3.2 Genesis of the Project

The original Pasar Pasir Pinji in Ipoh, Perak was constructed in 1959. Damaged over the years due to fire and natural wear and tear, the building had degraded into a dilapidated state in modern times. In end 2018, a design exercise to carry out a thorough study and proposal of a new wet market was initiated by the then Perak State Executive Council member, YB Howard Lee.

Most wet markets in Malaysia share many common failings, such as insufficient natural lighting, poorly designed drainage resulting in wet floors, disorganised refuse areas, and more. Such problems are usually due to substandard planning and management by the authorities, coupled with a general lack of awareness among users.

YB Howard Lee commissioned Kuee Architecture to propose a modern sustainable wet market that would act as a game-changer for not just the state of Perak, but for the entire country. Parallel to this was to also have a revamped civic education programme for local residents to ensure the successful delivery and maintenance of the new market upon its completion.

3.3 Design Concept

The form of the building was inspired by a well-loved building in the city centre of Ipoh, known colloquially as *Bazar Bulat* or Round Market. The iconic building, which was demolished in 2001, is still fondly remembered by many townspeople. Built in 1961, it served as the Yau Tet Shin Market and shopping centre that sold various goods, and was well received by both traders and the public for many years.[5]

Fig. 8. The *Bazar Bulat* in Ipoh town was also known as the 'Octagon Centre' amongst the Chinese community, due to the many angles the building formed

The roof structure for Pasar Pasir Pinji has been designed to have a direct resemblance to the *Bazar Bulat,* albeit stretched and evolved into a modern form relevant to the 21st century. It is hoped that evoking the nostalgic memory of *Bazar Bulat* will carry on the legacy for many years to come. With eight modular structures, the concept of the octagonal design of the *Bazar Bulat* is elaborated further in this new wet market.

Fig. 9. The stretched resemblance of the much remembered 'Octagon Centre' in the exterior form of the new wet market

3.3.1 Sustainability

The building's electricity consumption primarily comes from lighting and fans. The roof structure – an evolved butterfly shape – incorporates the stretched roof edge of the *Bazar Bulat*. Ample gaps created from louvres between the roof members allow for soft sunlight from the north and south to penetrate into the building, reducing the need for artificial lighting.

Energy-saving HVLS fans are used to increase air velocity, funnelling hot air to escape through the roof louvres while allowing cooler breezes to enter the building from the lower levels. Ventilation simulation modelling and analysis were done to identify the most effective building design and layout to ensure good natural ventilation, better air circulation within the market spaces, and to reduce the potential accumulation of odours. The sub-basement car park was also designed to be fully naturally ventilated, with adequate natural lighting introduced through louvres to ensure a safe space for the public.

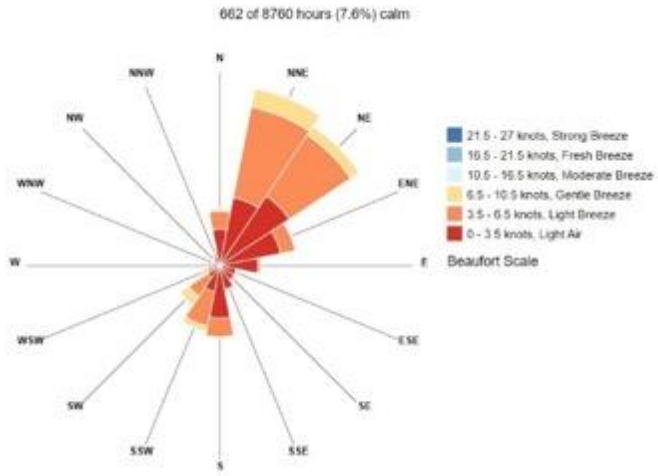

Fig. 10. Wind directions in the area suggested that more high-level openings in the façade would increase natural ventilation within the market

A food converter, installed in an allocated refuse area, converts food waste to fertiliser. It is hoped that up to 125kg of waste can be processed daily, overcoming the typical food waste and pest problems of wet markets. 1,875 litres of rainwater is expected to be collected at the lowest part of the metal roof module and brought down through the steel columns. This rainwater will then be filtered and saved for landscape irrigation and floor washing, resulting in up to 60% savings on the overall portable water used for the building.

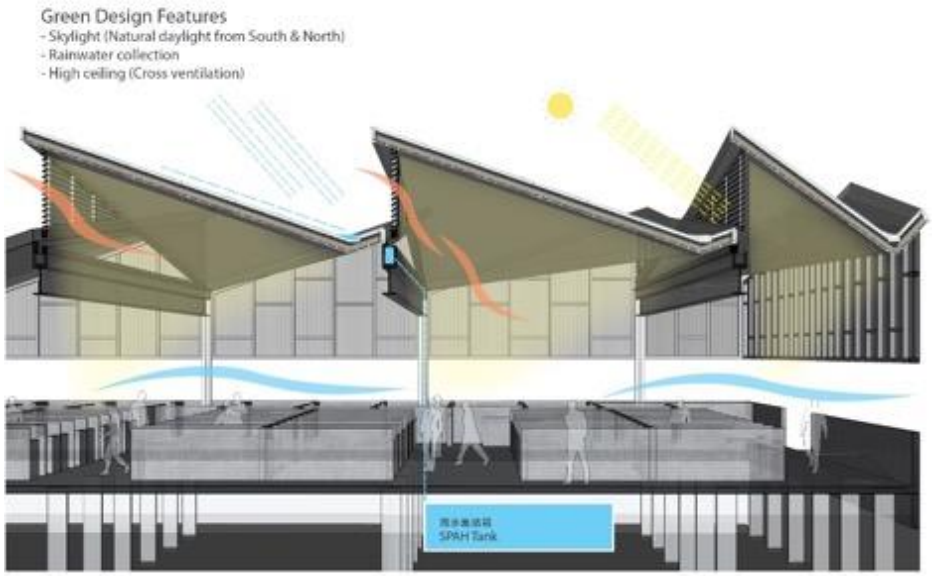

Fig. 11. Summary of green features introduced within the market

Pasar Pasir Pinji also features universal design concepts. Several gentle pedestrian ramps are located at the main entrances, with a lift connecting to the sub-basement car park. Instead of the two-level platforms of the original market, the new market has been made into a single level to be fully accessible to wheelchair users.

In terms of building materials, environmentally friendly products or those with high recycled content are used, e.g., waterproofing, metal deck roofing, external paint and coating, etc. Green spaces are an essential component of healthy and vibrant communities.[6] Trees, shrubs and creepers have been planted around the perimeter of the building, especially in the food court area, where the local community can sit and enjoy their food. As part of the Ministry of Housing and Local Government project requirements, an IBS (Industrialised Building System) score of 75% was achieved through the introduction of a steel structure modular design system that includes the roof, trusses, columns and beams.

3.4 Impact on Community

> *"Architecture is not an individual act performed by an artist-architect and charged with his emotions. Building is a collective action" – Hannes Meyer, Director of Bauhaus, 1928-1930*[4]

After the initial proposal, the first workshop review was held between Majlis Bandaraya Ipoh (Ipoh City Council) and Kuee Architecture on 1 March 2019 to discuss the requirements of the wet market based on standard government guidelines. This was followed by three sessions of public engagement, from 14 to 16 March 2019, in order to receive feedback from the local community about their concerns and queries regarding the new proposed design. These sessions served as an excellent opportunity for the project to be exposed to a more inclusive audience, as well as to install a sense of pride, involvement and accountability amongst the community.[7]

The built environment works better if the people who use it are directly and actively involved in its creation and management.[8] The community should always be engaged in the early part of a community project so that no assumptions are made during the design process that may result in changes that are almost impossible to make later on. All the stakeholders of the project, from the Ipoh City Council, State Exco members, local residents to the consultants of the project offered their valuable insights to help bridge the gap between a design idea and the actual needs and wants of the community.

A public voting session was then held on 16 March 2019, and more than 90% of the local residents were found to be supportive of the project. After the conclusion of the hearing, all views were compiled, and adjustments were made to the proposal.

Placing people at the centre of the solution is paramount to gaining the required insight to generate healthier and more inclusive cities.[9] Though not exactly a ground-up approach, the process of engaging the community ideally gave ample opportunities and time for them to be part of the design process. This was a first-of-its kind public project – a piece of democratic architecture that encompassed all social, empathetic and sustainable elements, and where all voices from various stakeholders were heard and considered.

Fig. 12. Public engagement sessions held from 14 to 16 March 2019

Fig. 13. The public voting session on16 March 2019, which resulted in more than 90% of the local residents supporting the new wet market design

4. Project 3: Kek Look Seah Crematorium *Ipoh, Perak, Malaysia*

4.1 Introduction

The Kek Look Seah Crematorium was built in 1962 to meet the needs of the townspeople for a proper facility for cremation. Back then, the general public was relatively poor, and having the funds to build the building was a challenge. With donations from committee members and the public, enough money was eventually collected after a few years to rent the land, build and upkeep it. Six decades later, Kuee Architecture was asked to design an extension to the existing crematorium in order to cope with the increasing demand, especially for the less privileged people within the community.

A funeral has a profound impact on the grieving process for people. During this time, people are filled with a variety of emotions, e.g., love, hate, disappointment, relief, shame, guilt and gratitude.[10] Kuee Architecture understood that it was a delicate mission to deal with the remains of the passing and their families, essentially being entrusted with the task of conceiving an 'Architecture for Death'.

4.2 Genesis of the Project

Occupying a flat 24-acre plot of land situated next to an existing crematorium, this new extension will be developed in two phases. The first phase consists of eight blocks of columbarium and the majority of the shared common areas such as the praying hall, restaurant, and offices. Phase 2 will be developed further using a similar layout upon the successful delivery of Phase 1.

There are four blocks of niche spaces within each compound, facing either a garden or a reflection pond. Within the compounds are pockets of smaller gardens and breakout spaces, all of which are surrounded by high walls for security and privacy. Unlike conventional crematoriums or columbariums that can be uninviting or somewhat unsettling, this place has been designed to be airy, spacious and comfortable for all visitors.

Fig. 14. The 24-acre land separated into two phases of development

4.3 Design Concept

A crematorium is a unique space for visitors – a confrontation with the afterlife. To deal with the process of recovering from the loss of loved ones, rituals have been developed, and regardless of religion, the team realised that it was important to emphasise the passing by creating a ‘one-in-one-

out' circulation sequence[11]. With a one-way circulation of space, people are guided through a series of moments – from the arrival, ceremony, cremation to ultimately leading them back to the outside world.

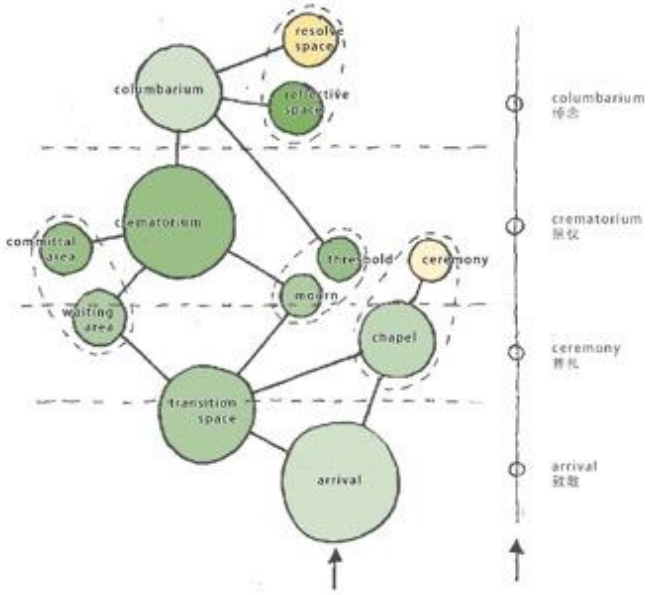

Fig. 15. One-in-one-out circulation sequence to emphasise on the passing of loved ones

This ritual of a separate exit provides the potential for scripting the procession.[12] At least two types of routes have been introduced here: one for funerals, which are one-off; and the other for the yearly memorial visits during *Qingming*[13], which are repeated visits. A succession of spaces is joined: from the arrival to the ceremony and through to the crematorium, common areas and exit. The act of passage itself provides time and distance to comfort people.[14]

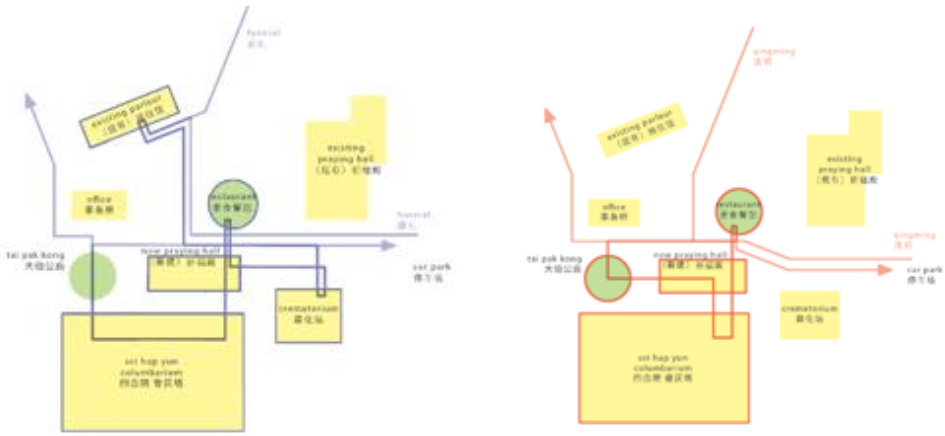

Fig. 16. The different routes for visitors during a funeral (one-off) and the subsequent repeated visits during *Qingming*

The owner's Feng Shui Master had asked the team to follow the concept of a traditional Chinese *siheyuan,*[15] for which there are an almost equal number of buildings in each direction, facing north, south, east and west, so that the families can select those suitable to their requirements.

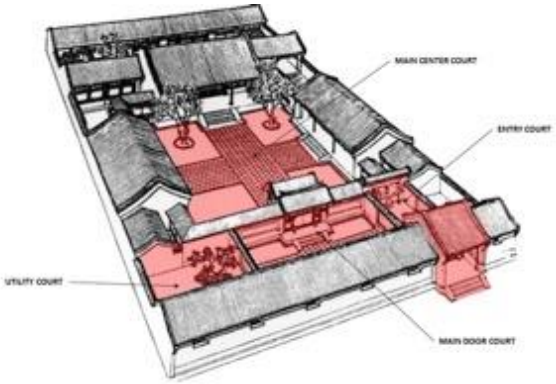

Fig. 17. Design layout based on *siheyuan*[15], with an equal number of blocks facing east, west, north and south

The client had specifically asked for a non-religious design, a neutral building 'with a calm, tranquil character' and spirituality that feels comfortable to all faith groups. As such, the crematorium and chapels were designed to be neutral, providing flexibility for families to personalise the funeral process according to their cultural traditions.

During the design process, explorations were made into how the building can help people in a time of crisis by creating a calming space – as a way to help the grieving recover from the psychological turmoil of the loss of a loved one. Instead of cold and bland spaces, greenery has been incorporated as much as possible. A patio space marks the entrance and also acts as a transitional zone, gently leading mourners from the busy streets outside before leading them onwards to the more relaxed spaces inside.

Fig. 18. The routes and the views are carefully curated, softened with a delicate landscape, while the presence of water reflects on the circle of life. The tranquillity of both the green landscape and water provides solace and comfort to mourners

4.4 Impact on Community

Empathetic architecture is a concept that involves designing spaces that respond to the emotional and psychological needs of their occupants. Kuee Architecture recognised that a sense of place was important for mourners – to reassure them that their deceased loved ones were being handled with respect. This should be a place where one feels safe, and during and after the time of loss, it is also important for people to have a place to relate to the mourned.

30% of the niche spaces have been allocated for the B40 income group[16] and 20% for the M40[16] income group. The deceased individuals deserve a decent place to rest, regardless of their income group, race or status in society.

It is undeniable that architecture is capable of inducing emotions in people, as with this crematorium – a skylight above the interior allows for light to shine into the space, emphasising the area's sacredness. The play of light and shadow adds a spiritual dimension to the building.

Fig. 19. A slit above allows sunlight into the space, creating a spiritual atmosphere for visitors. The changing shadows at different times of the day reminds one that life goes on outside

"Remembering the dead is not a passive moment but a potent experience of the sacred."
— Douglas Davies, The Sacred Crematorium

Architectural language can serve to deepen the significance of the emotional experience for mourners. It "must speak to the soul, offering an uplifting and memorable architectural experience symbolic of the intense personal and psychological experience of the transition from life to death.[17] Many of us have been to funerals and have been emotionally overwhelmed. As such, pockets of breakout spaces have been created for people to retreat into, to have a little more privacy when needed. These quieter and carefully crafted areas are intended for private meditation and not for mass gatherings. In a radical expression of empathetic architecture, the mental and emotional wellness of the family have been prioritised.

Fig 20. Breakout spaces are located at various indoor and outdoor locations. These spaces serve as private reflection areas

The pure and simple geometry of the building exudes calm. The screens, made of metal, create sensual and spatially engaging environments. The lotus pattern on the metal screens pays homage to the original flowers found on the site.

The use of materials was kept simple: stone and marble are primarily used, especially white marble with grey veins sourced from local Ipoh hills used for the walls and floors. With marble's decreasing popularity in recent years, it was the team's intention to revive the use of the material. Additionally, the team employed leftover odd-sized pieces to help reduce marble waste in the industry.

4.4.1 Sustainability

In terms of natural ventilation for the blocks, a high roof with openings was proposed with the intention of bringing in constant wind primarily from the east and secondarily from the northwest and northeast. With the wind passing through the louvres and in between the building blocks, the result is a self-cooling environment with minimal application of fans, where no air conditioning is required throughout the year.

Fig 21. The wind chart of the site with data for the past ten years, and the resulting openings in and within the niche blocks to allow for natural ventilation

5. Project 4: 1 Lasam *Ipoh, Perak, Malaysia*

5.1 Introduction

1 Lasam was conceptualised more than eight years ago by the owner, Dato Lim, when the green building rating tool was new and there were no other green-rated buildings in Perak. The amicable and ambitious client wanted to build the first ever Green Building Index (GBI) Platinum building in the state to resonate with the group's motto of being a pioneer in many of the businesses they have ventured into over the decades.

5.2 Genesis of the Project

Measuring about 30,000 square feet of office space, the 5-storey office block houses typical office workspaces with ancillary spaces such as conference rooms, gallery spaces and more. The design team explored the concept of floating boxes, which further developed into a unique 'box-in-a-box' geometry. The higher floors are lifted up and supported by a bold V-shape column to allow for vehicle circulation on the street level (Fig. 22).

Fig. 22. To resonate with the v-shaped land and column, v-shape balustrades were designed to emphasise the alphabet 'V', which is part of the client's parent company name, 'BVH'

With a neighbouring army camp, there were many restrictions placed on the building design. Firstly, the building was limited to five-storeys, with the roof level prohibited for access except for services. These restrictions are to minimise overlooking into the camp. Secondly, the west-facing double-layered wall with dense louvres – which were approved by the army – was installed not only to eliminate a direct view of the camp, but to also block the penetration of heat and sunlight into the office spaces in the evening.

5.3 Design Concept

A central courtyard was carved out in the centre to allow more daylight into the office spaces. Naco windows are installed at high levels of all office spaces for natural cross and stack ventilation through the central courtyard, so much so that no air conditioning would be required on cooler days. Grasscrete for lowering the heat island effect was installed at the driveway and car park to further bring down the overall temperature of the site.

The owner had requested for a floating box concept for the building. The team tested out different versions and finally settled on a box-in-a-box effect (Fig. 23). This box-in-a-box massing structure serves as a heat barrier to the sides facing east and west. The huge cavity between the walls effectively blocks sunlight and heat from the sides. Thick roof insulation with high thermal resistance was applied to prevent heat from the roof. With these two approaches combined, the interior temperature fluctuates far less compared to a conventional building.

Fig. 23. The box-in-a-box effect prevented heat from the east and west from penetrating into the building. When combined with the thick roof insulation, temperatures within the building was kept highly stable.

5.3.1 Sustainability

Eight categories for the United Nations' Sustainable Development Goals were achieved (Fig. 24). One of the complying categories was for 'Responsible Consumption and Production', which was achieved with the usage of a relatively high percentage of recycled construction material. Construction waste on site was also kept minimal, with much of it being recycled.

Clean water and sanitisation also played an important role in the design of the building. While both rainwater harvesting and greywater recycling led to a high reduction in the use of potable water, storm water control for effective water drainage was also catered for, by using a bioswale constructed on site (Fig. 25). 1 Lasam was chosen to be included in the UIA Guidebook for the 2030 Agenda for its extensive fulfilment of Category 6.

Fig. 24. Eight out of 17 Categories of Sustainability Development Goals (SDGs) were achieved

Fig. 25. Summary of points achieved to fulfil GBI (Green Building Index) Platinum certification – the highest possible, and the first such building ever in the state of Perak

5.4 Impact on Community

As the building neared completion towards the end of the COVID-19 shutdowns, the team asked a similar question to the one that was asked by Alice Coles, president of the Bayview Citizens for Social Justice, who remarked, "The challenge is yet to come... Now there is beauty on the outside; how do we come back and build the infrastructure within the human soul?"[18]

The building was initially designed to be predominantly an office space. However, the client did some estimations and predicted that the building would be underutilised. After several rounds of brainstorming between the client and the architect, some of the spaces were reconsidered. During the early months after the completion of the building, some spaces slowly evolved and were later made flexible, eventually turning into a community library, a co-working space and a meeting area for local non-profit organisations.

5.4.1 Educational

Design cannot promote inclusive publics if there is no champion behind it.[19] The client, Dato Lim, originated from a family in Ipoh that has always been active in promoting the history and culture of the city. As a collector of over thousands of artefacts from the tin-mining era, the Lim family has been on a mission to educate the public through the preservation of items from the past.

Taking over a year, the building was slowly turned into a free museum of all sorts, showcasing the history of Ipoh by displaying antique plaques and items from the once glorious tin-mining era. Today, visiting 1 Lasam is akin to walking through a time tunnel. The double walls of the box-in-a-box concept, coupled with the insulation on the roof, have helped keep temperatures highly stable, and consequently made the spaces very conducive for the preservation and display of antiques.

The free library in the meeting room doubles up as a meeting place for local non-profit organisations such as Dementia Awareness, the Chinese Orchestra and the Perak Academy, which supports local start-ups and young entrepreneurs. Organisation meetings are held at 1 Lasam without

charge, and the conducive space has led to more locals keen on participating in the activities of these non-profit organisations (Fig. 26).

Fig. 26. Spaces within the buildings were designed to be flexible and convertible, such as the free-of-charge meeting places for several non-profit events and organisations

The building has also encouraged learning and awareness for users and visitors alike. GBI features such as the Building Management System (BMS) allow visitors to understand how a building works via real-time energy and water usage displays. With the entire building powered by solar panels on the roof, the BMS also serves as an example for the city to monitor the effectiveness of solar power on this scale.

There are also notices installed all around that encourage users to be as green as possible. Being the first and only GBI Platinum building in Perak – the owner has a great role to play within the local community in educating and raising awareness of sustainably built environments.

The client's company has also encouraged workers to be creative with recycled materials. Workers make their own sculptures with leftover stainless steel, and use wooden planks as planters for herb gardens. They have been encouraged to be creative and innovative while at work or outside work, and this has helped to cultivate their sense of belonging to the company.

5.4.2 Comfort

The fluidity of the spaces and comfort within the building have created a conducive environment for a wide range of activities for the public. The central courtyard promotes cross- and stack-ventilation. On a cool day, air conditioning is not required. All common areas such as the corridors are entirely naturally ventilated. With a shallow floor plate design, daylighting is effectively harvested to reach all of the interior spaces.

Whether a building is really sustainable is something we can only determine retrospectively.[20] A 6-month post-occupation survey was done (Fig. 27) on permanent users, and the results were that 61% were happy with the interior temperatures, 82% were satisfied to very satisfied with the air ventilation, and more than half were happy with the indoor air quality and daylighting. There were also no reported cases of eye or throat dryness, dizziness, stuffiness, headaches, skin irritation, etc. found among the office workers, as compared to their previous workplace.

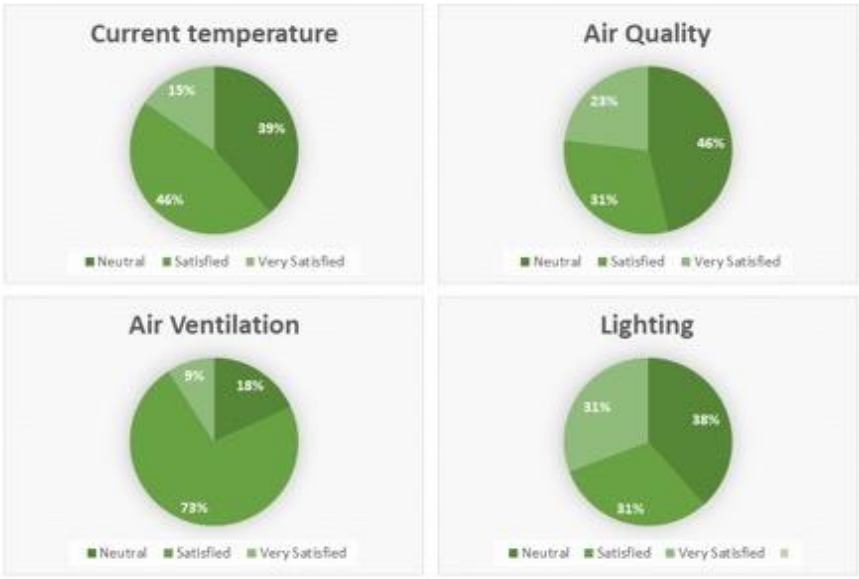

Fig. 27. Six-month post-occupancy survey done to permanent users of 1 Lasam

Greenery has been found to help increase productivity and replenish focus in workspaces. It has been proven that people spend longer in spaces with biophilic designs, and workplace happiness improves when natural elements are introduced.[21] For 1 Lasam, all plants in the building were either propagated on site or brought over from the company's other premises. No new plants were bought.

Fig. 28. This is an office building where you can see greenery from almost any angle – with vertical gardens, courtyards and herb gardens

5.4.3 Cost

Materials were selected carefully to reflect the client's intention to keep the building as 'raw' as possible, and to use locally sourced materials (see Fig. 29). Bare concrete produced with Ipoh's limestone, coupled with locally crafted artisan red bricks applied with a waterproofing solution were used. Not a single drop of paint was used in the entire building, so as to reduce the exposure to paint chemicals and maintenance costs in the long run.

The simple and durable materials chosen for this building have successfully brought the construction cost down to a mere USD16 per square metre, which is notably low not just in Malaysia

but in the context of any country in the world. By successfully controlling the construction budget, the team was able to prove that it was possible to create a building that was functional and sustainable within a limited budget.

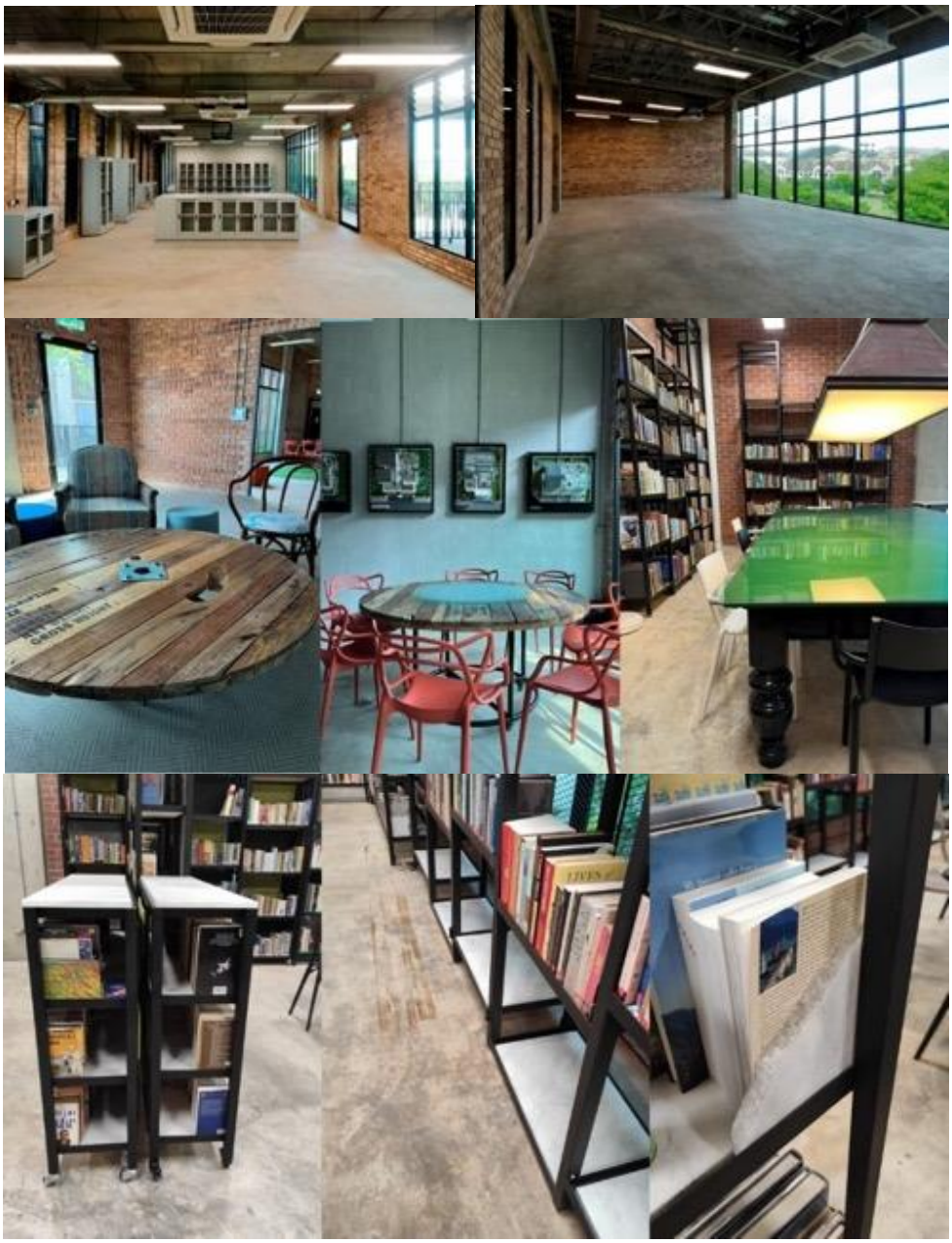

Fig. 29. Finishes such as the exposed concrete and locally made clay brick are left as "raw' as possible for ease of maintenance and to keep construction cost low. Leftover pieces of marble slabs from local quarries were turned into shelves in the library. All furniture in the building has been repurposed from old items from different sources.

6.0 Summary

Through the four projects featured in this paper, Kuee Architecture has demonstrated the integration of social, empathetic and sustainable architecture into their projects, in one way or another. Designed with a deep understanding of local culture and community dynamics, these projects have incorporated biophilic design principles to foster a sense of connection with nature, while promoting well-being and mental health. Social cohesion has also been prioritised through a participatory design process, accessible infrastructure, and opportunities for community engagement, creating vibrant and sustainable neighbourhoods that enhance the quality of life.

The *Galasa Event Place* is one of its kind, combining aesthetics with functionality while focusing on inclusivity. The sustainable implementation, combined with the simple yet effective design of the place, has enabled it to be functionally adaptable to the needs of the community. Since its completion, it has become a cultural epicentre for the city of Ipoh, serving as a venue for a myriad of rich cultural activities.

The *Pasir Pinji wet market* is a successful piece of social architecture in which local residents have a sense of ownership over the building. The team put in all their knowledge and skills into making sure that the building was actually what they wanted and needed. The building served as a great example of how architecture can be made to serve communities better when the focus on design and concept is shifted to a focus on ensuring sustainability and achieving long-term social impact. It has instilled a sense of communal pride, as the community were afforded a certain level of involvement and accountability.[5] This ambitious wet market will be the first of its kind in the state to achieve the GreenRE Silver standard in Malaysia. It will stand as a bold, leading example of how a public building can incorporate extensive sustainability design features, and will be opened to the public in 2026.

The architecture of the *Kek Look Seah Crematorium* is neutral, serene and monumental, yet not overwhelming. It was not the intention to create an architecture that is solemn, but one that exudes calm and sacredness – by utilising the right metaphors combined with thoughtful planning. It is hoped that the building will in some way help mourners heal and continue to live on with a positive attitude. It is a successful demonstration of empathetic architecture in terms of taking a sympathetic approach to dealing with both people and the planet in a delicate way.

1 Lasam is one of the boldest new additions to Ipoh's low-profile skyline. Since its completion, its head-turning architecture has attracted interest from both professionals and the public. There has been national and international recognition, among them the Pertubuhan Akitek Malaysia Silver Award, the Perak Low Carbon City Awards, the Edge-PAM Green Excellence Award, and the Asia Pacific Property Award. As the grand finale of this paper, this project serves as an all-rounder with successful implementation of social, empathetic and sustainable architecture, and is set to become the standard-bearer for the city in the years to come.

Kuee Architecture is committed to societal well-being and environmental stewardship, and has pledged to continue focusing on projects that not only benefit the planet but also uplift communities. With the collective knowledge and experience from all the projects discussed above, Kuee Architecture will be more confident to encompass a holistic approach that considers the social, economic, and environmental impacts for future projects, fostering a more sustainable and equitable environment for all.

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[13] *QingMing* Festival, literally meaning Pure Brightness Festival, takes place on the fifteenth day after the spring equinox. As a holiday devoted to remembering and honouring the deceased, people sweep and decorate gravesites, burn incense. and paper money, and make food offerings.
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[15] A *siheyuan* is a historical type of residence that was commonly found throughout China, most famously in Beijing and rural Shanxi. Throughout Chinese history, the *siheyuan* composition was the basic pattern used for residences, palaces, temples, monasteries, family businesses, and government offices.
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