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### SPATIAL PLANNING OF MUSLIM CEMETERIES: A FOCUS ON SUSTAINABLE DESIGN PRACTICE

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#### *Abstract*

This study examines the standard procedure involved in terms of spatial planning and design at three case studies namely Section 9 Muslim Cemetery, Kuala Lumpur-Karak Cemetery or also well-known as Radhatul Sakinah Memorial Park and Taman Selatan Muslim Cemetery. The research is focused on sustainable design practice for the provision of amenities at those cemeteries, which emphasises the inclusion of people not only as a visitor but as well as the users of such place. The development of burial infrastructure for Muslim cemeteries has begun to shift in recent years from its conventional style into a memorial park concept. This emerging trend signifies a momentous change for Malay-Muslim cemeteries in terms of its creation and meanings. However, this transition should be analysed before it can be translated into Cemeteries and Crematoria Planning Guideline (CCPG) draft for future development. Recorded site observation of cemetery area has been employed as a mean of data collection and interpreted by conducting a spatial analysis across the case studies. The spatial analysis entails the assessment of form and function based on sustainable design principles. The finding exhibits layout of Muslim cemeteries requires some modifications to be in line with sustainable design practice. This article concludes by providing recommendations that will help to align the current spatial planning of Muslim cemeteries with sustainable design practice.

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**Keywords:** Muslim cemeteries, spatial planning, sustainable design practice.



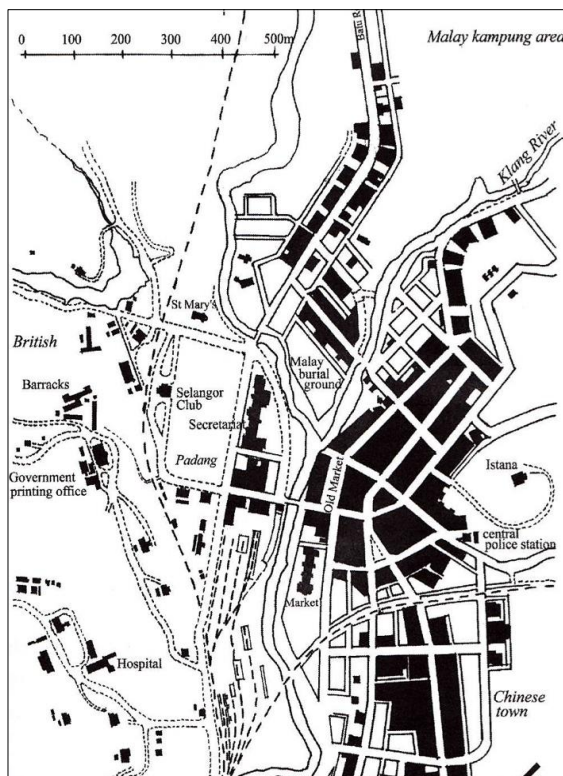
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## 1. Introduction

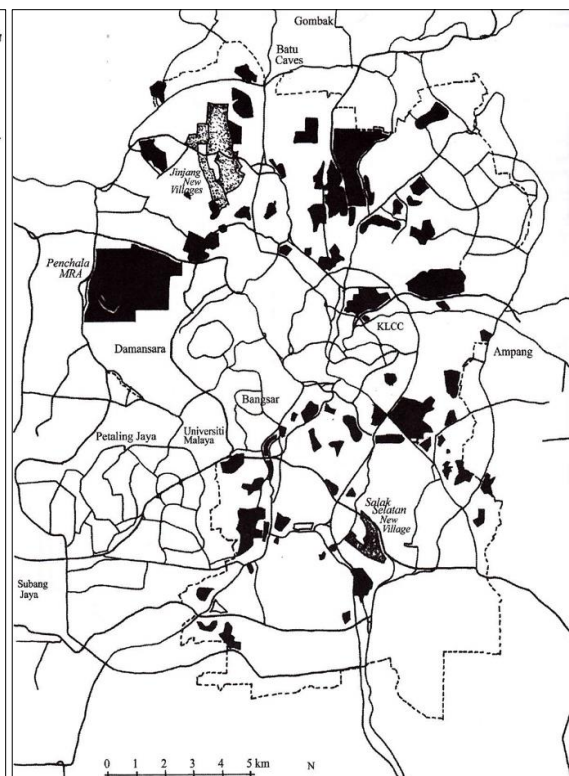
This paper aim to look at the spatial planning for Muslim cemeteries that concern on two main aspects which are; firstly, the procedure in designing the layout plan of cemetery as being documented in Planning Guidelines (PG): Islamic and Non-Muslim Cemeteries by Department of Town and Country Planning, Peninsular Malaysia (JPBD) in 1997, and secondly the direction that urban cemetery within Kuala Lumpur metropolitan region is heading as demonstrated by the local authorities involved in this study.

### 1.1. The early history of Muslim burial grounds in Kuala Lumpur

In the late 19th century Malay burial grounds were located outside their village settlements, well known as kampung. The urbanisation process in Kuala Lumpur (KL) has somehow disconnected Muslim cemeteries (Malay burial grounds) from their settlement (Malay kampung area) as shown in Figure 1. The map suggests that the cemetery might have been gradually encroached upon by the surrounding development and then became isolated within the city area. The cemetery site no longer exists and has now been replaced by iconic landmarks of KL, the Jamek Mosque and the City Hall Theatre. This same pattern persists in the following decades, where public cemeteries have been separated from the rest of their surroundings either by physical means, such as the use of boundary structures and visual barriers, or geographically, where they are usually situated far away from human intervention.



**Figure 01.** Map of early Malay settlement in KL (top right) in relation to the location of graveyards, demonstrating the evident disconnection between them. Source: Kuala Lumpur and Putrajaya: Negotiating Urban Space in Malaysia (King, 2008)



**Figure 02.** The Malay reservation areas, traditional and modern kampung, and new villages of KL. Source: Kuala Lumpur and Putrajaya: Negotiating Urban Space in Malaysia (King, 2008)

Muslim cemeteries were gradually excluded from the city's urban plan right from the beginning because there aren't many significant uses of cemeteries that crucially link to the daily function of the city. Figure 2 shows the location of Malay reservation areas in KL, which also indicates that the provision of public cemeteries around KL is found to be imbalanced compared to the Malay settlements that are marked by the dark regions. Muslim cemeteries used to be located within a close distance from Malay settlements in the city, but then this pattern has changed due to the intense consumption of urban areas. Competition for space is immensely harsh due to rapid urbanisation.

## 1.2. Muslim cemetery as part of public open space

In the era of globalisation, contested space has become a central issue for most Asian cities including KL. This phenomenon has resulted in urban cemeteries being pushed beyond the city's boundaries. Urban issues such as diminishing public spaces, lack of green open spaces for public enjoyment and recreational needs, are some of the examples that have resulted from the contested space. This situation is expected to become more critical in the future as KL is progressively expanding similarly to many other megalopolises around the world. Rapid urbanisation and urban sprawl have severely impacted on the provision of land for burials. A change of method to burial such as vertical cemetery can help to ease the scarcity of land for burial in this city (Neckel, Costa Mario, Sabadin, & Bodah, 2017; Hariyono, 2015). Even though the issue of land shortage for burials can be addressed with the introduction of the vertical cemetery, this spatial solution is perhaps too drastic to be accepted by the public. The fact is a change of methods in burial is a delicate and sensitive matter to be discussed among Malaysian multiracial citizens. For instance, non-ground burial is inapplicable in Islamic burial practice as Muslims adhere to full-body interment.

Klaufus (2014) stated a changing deathscape is unavoidable due to urban densification and spatial conflicts that persist in metropolitan cities around the world. In today's context, cemeteries have been perceived negatively and it seems there is no space left to be reserved for burials, especially when urban sprawl is so significant. A few studies have put forward some serious problems worthy of attention. There have been many cases that highlighted the flaws of cemeteries which proven to bring hazard to the living condition of immediate communities as well as threats to human health (Neckel et al., 2017; Klaufus, 2016). Thus, it is important to examine the potential use of urban cemeteries with extra features to their functions and values which could also help to address the escalating urban issues at the same time.

In the Victorian era (circa 1880), the transformation of urban cemeteries into civic space was motivated by the urgency to promote healthy lifestyles and moral improvements especially among the lower class (Brown, 2013). In Germany, the transition of war cemeteries from its traditional significance into functionalism has progressively evolved directly after World War I ended. The intended purpose of the commemoration of war cemeteries was subsequently supplemented with the inclusion of green landscapes that enabled a new reinterpretation (Carbonero, 2017). There have been studies that focused on the missed opportunity use of urban cemeteries as part of public recreational areas by making close examination on the policy involved at the administrative level (Nordh & Evensen, 2018; Craig & Duncan, 2016). A study conducted by Evensen, Nordh, and Skaar, (2017) concentrates on necessary improvement of design layout, internal circulation as well as the provision of amenities related to recreational activities to encourage user's engagement at the cemeteries.

It is necessary for the city to re-establish connection with new cemeteries by taking consideration on the urban issues particularly the absence of green open spaces to fulfil people's need for leisure and recreation. Thus, a thorough investigation needs to be conducted before such provision can be achieved and materialised. The physical condition of cemeteries has to be closely examined to make sure KL is heading towards that direction. Taman Selatan Memorial Park (TSMP) is probably the first Muslim cemetery that has been built in a spirit of memorial park. TSMP in Putrajaya can be considered to be different in comparison to other Muslim cemeteries in KL metropolitan area. It shows a different approach from the typical Muslim cemeteries in terms of its spatial planning and design. The creation of TSMP was a major step taken by the Putrajaya Corporation as a way to cultivate aesthetic elements and systematic planning and design for a new model of urban cemetery. This is not a surprising fact because TSMP has been part of the development of Putrajaya as the new township in Malaysia since its first inception circa 2000.

However, the establishment of TSMP as a memorial park has not been getting much attention from people because it is ahead of its time. This is because there is no prevalent issue related to burial infrastructure during that time. Even to this day, there are not many people living in Putrajaya due to its low population density. It is expected that this 'new genre' of public cemeteries will emerge within KL metropolitan soon, which focusing on providing a burial space that furnished with attractive landscape and functional design. The new public cemeteries will be purposely meant to be used more by the living rather than the dead, something that is found to be missing from a common memorial park in Malaysia. This will also be an added value to the urban cemetery as well as the city as a whole through its hybrid function. In other words, the lifespan of cemeteries should be prolonged in terms of its role and use as a place. Furthermore, a mixed used is one of the desirable characteristics for sustainable development (Scheer & Scheer, 2002). Thus, there should be a new approach to how Muslim cemetery is going to be built. There is a great concern to activate dead public spaces (Mok, 2012). Initiative for a cemetery with a hybrid function is a way forward that should be considered by the local authorities in Kuala Lumpur.

### **1.3. Muslim cemetery as part of public open space**

Urban cemeteries have been associated with rich biodiversity in its character which opens up an opportunity for interest in leisure activities and healthy living environment (Kowarik, Buchholz, Von Der Lippe, & Seitz, 2016). In the United Kingdom, an effort to increase the performance of environmental quality has taken a new approach by incorporating natural burials into cemeteries (Clayden, Green, Hockey, & Powell, 2017). This is since natural burial tends to support the protection of the ecosystem and ecological preservation.

Cemeteries have always been regards as an emotional landscape due to its association as a resting place for death. According to Woodthorpe (2011), cemeteries in the UK can be categorised into three types of landscape, which are emotional, community and commercial. Woodthorpe (2011) stated that contemporary cemeteries could be sustained by implementing a set of policies that are capable of negotiating different uses and perspectives. The second and third types of landscape do exist within Muslim cemeteries however they are not so dominants in comparison to the first. However, public cemeteries are expected to be more open with multiple roles to play in the city to address prevalent urban issues that KL is currently facing.

In terms of community landscape, the social aspect can only be discerned during the funeral ceremony at the cemeteries. A Muslim funeral rite is a communal event which is normally managed and organised by a burial community which was also known as *kariah*. The social aspect of Muslim cemeteries should be promoted because it is in line with Sustainable Development Goal 11 which is to make cities and human settlements inclusive, safe, resilient and sustainable (United Nations, 2019). It is also important because it is the way forward to ensure the survival of urban cemeteries in the future. Thus, KL administration should introduce this new type of urban cemetery that permits public access for their recreational use. Perhaps the social meaning of community landscape at Muslim cemeteries can be extended from a cultural significance into a wider realm by integrating public spaces into its creation through hybrid function. Moreover, community involvement at local and regional levels is vital when it comes to cemetery planning. Public opinions are essential to predict the impacts of such development to the surrounding suburbia. As the end-users, people's way of life is pretty much determined by future developments invested by the stakeholders (Bennett & Davies, 2015; Tudor, Ioja, Hersperger, & Patru-stupariu, 2013).

As for the commercial landscape, it is only limited to trading activities that happened between visitors and the grave builders in negotiating for the price of the grave's *kepek* to be built on behalf of the bereaved. Only grave builders that registered with local authorities are allowed to be appointed by the users to ensure assurance and to avoid dispute between the two parties. A deep study is needed to discuss the possibility of Muslim funerary commercialisation and cemetery's ownership in Islam. Both topics are interrelated because it will determine how the 'new' category of Muslim memorial park is going to manage and maintain.

#### **1.4. Sustainability urban form and the elements of spatial planning in Muslim cemetery**

Cemeteries require long term planning to sustain their primary function as a resting place for the dead. The formulation of policies and guidelines have to consider both aspects of management and regeneration to ensure the sustainability lifecycle of urban cemeteries (Davies & Bennett, 2016). According to Scheer and Scheer (2002), there are eight characteristics of sustainable urban form (SUF) that can be applied to the creation of urban cemeteries which are; (1) integration, (2) conservation, (3) provide open space, (4) compactness, (5) preserving the existing form, (6) encourage moderate parcel size, (7) limit buildings to a moderate size, and (8) provide a mixture of building types, sizes, and age. However, only the first three characteristics are closely significance of this research. This study will examine the use of space and function inside Muslim cemetery by looking specifically on three main elements that made up its spatial components which are, (1) integration, (2) conservation and (3) providing open space. The remaining characteristics are still relevant to a certain degree but there are more suitable to apply for architectural buildings and not so much for outdoor space such as a cemetery.

Three main elements are being considered in determining the layout arrangement of Muslim cemeteries in Malaysia, which comprise of public facilities, reserved landscape and circulation system.

- Public facilities - Parking space should be provided with a minimum of eight-car parking lots and two parking lots for buses. One building for common facilities should be provided inside the cemetery. The size of this building should be within 400 square meters to accommodate an administration office, resting area, prayer room and lavatory.

- Reserved landscape – A 1.5-metre-wide reserved landscape area should be allocated along the pathway and the creation of green buffer is recommended to separate cemetery from other land use.
- Circulation system – Pathway dimension should be 2-metre-wide to direct visitors to the grave plots.

All of these elements were listed in PG (JPBD 17/97, 1997), and the Federal Territory Islamic Affairs Department (JAWI) and the Federal Territory Islamic Religious Council (MAIWP) are the two government agencies who are responsible for its implementation. Overall, these elements are meant to be used by visitors and not for the dead. These elements are provided to assist them while they are happened to be at the cemetery attending for a funeral ceremony. Therefore, local authorities need to emphasise on how these elements could contribute to the sustainability of urban cemeteries by focusing on the livings as the main users.

## 2. Problem Statement

In KL, public cemeteries have weaknesses and limited resources which are determined by several factors. Two factors have been identified as the most common problems affecting public cemeteries in KLMA including Muslim cemeteries. These factors are lack of detailed strategies in designing the layout of the cemetery and availability of land for burials in the city. The former is much more important than the latter to ensure the sustainability of the cemetery beyond its actual purpose as a place to rest the death.

Based on Sustainable Development Goals (SDG) there are three mains important gaps identified in this study. First, the procedure implemented by JPBD should comply with the concept of sustainable development. This can be achieved by adopting SDG into Cemeteries and Crematoria Planning Guideline (CCPG) draft. A Sustainable Cities and Communities can be attained by making cities and human settlements inclusive, safe, resilient and sustainable as stated under Sustainable Development Goal 11 (2019). The stereotype of the cemetery as a dead and scary place is a common perception among local people. Cemeteries have also been treated by authorities as a remote piece of land in KL due to this reputation. These negative views can be changed by integrating urban cemeteries into the public realm. Cemeteries should not be isolated from its surrounding neighbourhood by providing access and welcoming people into this sacred space. However, this should be done with a great cautiousness to avoid emotional distress to the deceased family. It is important to protect the safety and sanctity of the graves on behalf of bereaved families in dealing with this delicate situation. Moreover, the urban cemetery should be plan with flexibility in mind to stand the test of time. They have been many occasions where public cemeteries are found to be in the dilapidated state especially the old ones. A new genre of a public cemetery with hybrid function is perhaps the answer to this problem. This enhanced public cemetery should be designed in a manner that it will be able to play its additional role as a recreational spot even though it is no longer active as a burial space. Nevertheless, the concept of park cemeteries is not mentioned anywhere in the CCPG draft, which is surprising since MAIWP and JAWI have recently been eager to promote this idea within Muslim cemeteries (Pinvader, 2012; Rosly, 2011).

Secondly, Muslim cemeteries are constantly in need of replacement due to their finite nature. Even though this situation seems to be unavoidable, there are some aspects of cemeteries that should be considered for renewal especially in terms of design and management. One of Sustainable Development 2019 targets is to address resource efficiency under. The resource here is referring to the land use for burial because finding a suitable land within KL metropolitan is a challenging task. Finally, the report on SDG (2019) progress also stated that public spaces will become a necessity in the future. United Nation Sustainable Development Solutions Network has set the target to provide universal access to safe, inclusive and accessible, green and public spaces by 2030. The urban cemetery will provide a great opportunity for the municipals to meet people's demand for green open spaces. It is a perfect ground to experiment on the dual function of a cemetery for KL's growing population. Even though the concept of hybrid function may contradict with the Islamic tenets and local customs, however, urban cemeteries without additional values towards its surrounding context will likely to impair the civic life and escalate the urban issues related to burial infrastructure for worse. Therefore, local authorities should be more vigilant in meeting both people's need for a decent burial ground as well as providing ample outdoor spaces in the future. This is important especially for the betterment burial infrastructures in the future. A well-planned cemetery is much preferred rather than a retrofitting the existing ones.

### **3. Research Questions**

This question is much concerned with urging the authorities to provide sufficient grave plots along with better burial facilities. In particular, it will suggest that such solutions be predicated on extending or reimagining the public role of cemeteries beyond the disposal and care of the dead. The research question is:

- How to sustain public cemeteries by taking consideration of the spatial and current urban issues in Kuala Lumpur metropolitan area to be future proof?

### **4. Purpose of the Study**

There is a growing urgency for KL to address the way public cemeteries are being planned, especially with the emerging issues of land shortage, lack of space and overcrowding. There is a need to reform the way public cemeteries are being managed by the councils. The alteration to this standard procedure of conducting burials in Islamic tradition has to change if KL's aspirations to become a global city are to be realised. The purpose of this paper is to instigate for a more sustainable approach in designing for an urban cemetery by trying to change the spatial practices associated with public cemeteries, encompassing standard procedures and design strategies in preparing the layout plan, as well as the policies involved. Another motive of this study is to localise SDG into KL municipality's operation specifically for the provision of burial infrastructures.

### **5. Research Methods**

This research is looking at qualitative data because the research is about regenerating urban cemeteries, which is about interpreting what has been practised inside Muslim cemeteries, as well as

predicting future directions. Comparative case studies through observation and spatial analysis of diagrams are the methods employed to conduct this research. The diagrams used for spatial analysis is a simplified representation of each attribute observed at each case studies, and they don't represent the actual layout plan of the sites. The spatial analysis will be discussed under the findings based on the assessment of the form and function of each physical features of cemeteries that have been identified. The field works have been conducted at three Muslim cemeteries which are Section 9 Muslim Cemetery (S9MC), Kuala Lumpur-Karak Cemetery (KLKMC) and Taman Selatan Muslim Cemetery (TSMC). The presence of sustainable design practice at those three sites will be asses by examining the correlation that exists between selected characteristics of SUF (Integration, Conservation, Open space) and the three elements of spatial planning (Circulation system, Reserved landscape, Facilities) extracted from PG (JPBD 17/97, 1997). Refer to Table 1 for the checklist of the case studies.

**Table 01.** Checklist for the case studies

Selective Characteristics in SUF	Attributes Observed	Elements of Spatial Planning in PG
A. Integration	i. Perimeter	Circulation system
	ii. Accessibility	
B. Conservation	iii. Plants	Reserved landscape
	iv. Sun and shadows	
C. Open space	v. Facilities provided	Facilities
	vi. Spatial connection	
Case Studies		
1. S9MC ▪ Year established - circa 2007 ▪ Area – 12 acres ▪ District – Petaling Jaya	2. KLKMC ▪ Year established – circa 2007 ▪ Area – 81 acres ▪ District – Kuala Lumpur	3. TSMC ▪ Year establish – circa 2004 ▪ Area – 23 acres ▪ District – Putrajaya

Based on PG, the provision of public facilities, reserved landscape, and circulation system have been identified as the three areas that can help to improve the physical features of urban cemeteries (JPBD 17/97, 1997). Integration, conservation and providing open space are the three main components of sustainable development that can be adapted into the physical features of cemeteries (Scheer & Scheer, 2002). The application of these elements in the cemetery's layout is having a direct association with six identified attributes that has been observed. Integration can be applied in terms of two elements, which are perimeter and accessibility. Conservation can be applied in terms of two elements, which are plants and sun and shadows. Lastly, open space can be applied in terms of facilities provided and spatial connection within the cemetery. The goal is to confirm whether the attributes of the physical features observed in the existing case studies align with sustainable urban form (SUF) as prescribed by Scheer and Scheer (2002).

## 6. Findings

Three main findings have been gathered based on spatial analysis conducted on three case studies (S9MC, KLKMC and TSMC). Firstly, the stereotype of Muslim cemetery as a dead space should be changed by establishing the connection within its surrounding urban environment. It is an utmost step to integrate the creation of public cemetery into people's daily living by making it accessible to welcome more



users into this sacred space. Secondly, environmental conservation is a desirable component that leans towards sustainable development. The elements of conservation at Muslim cemeteries can be perceived in terms of plants found at the sites either the existing or the introduced ones. Even though it is considered as an admirable quality to have at the site, however, the plants introduced at the site should be carefully selected by taking advantage on their characters and function rather than solely for their aesthetical values. Furthermore, the future development of Muslim cemeteries should concentrate on a wider scope of conservation which includes the protection of the natural environment from the undesirable impacts of development such as the scale of earthwork involved at the site, as well as minimising intervention over wildlife habitat and their ecosystem. Finally, sustainable design practice also can be achieved through facilities provided which serve as the magnet to draw people into the site. The idea to incorporate open space as part of a cemetery in KL may seem to be odd and contradictory with the local custom. However, it will become the most crucial component that enables for the survival of this space in the city and should not be taken lightly. Table 2 shows the summary of the main findings of the study.

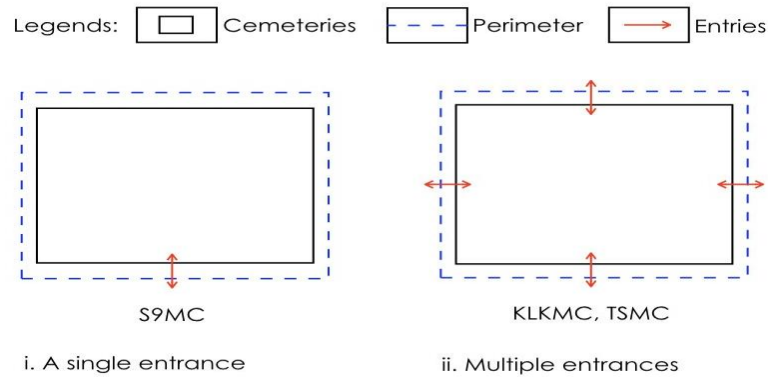
**Table 02.** Summary of recommendations for sustainable design practices in Muslim cemetery

Selective Characteristics in SUF	Attributes Observed	Characteristics of Sustainable Design Practices	Sector of Sustainable Development
A. Integration	i. Perimeter	Provide multiple entry points to promote interaction between the site and the surrounding area	Social
	ii. Accessibility	Allow parking spaces for vehicles within the site.	
B. Conservation	iii. Plants	Protect existing vegetation and promote planting at the sites.	Environment
	iv. Sun and shadows	Introduce systematic plantings at burial sections that focus on trees with vertical forms and low dense foliage.	
C. Open space	v. Facilities provided	Provide multiple facilities inside the cemeteries.	Social, Economic
	vi. Spatial connection	Provide internal road networks for vehicle access and well-connected pedestrian walkways.	

### 6.1. Integration

#### i. Perimeter

Integration in the context of the perimeter can be described as the ability of the site to offer multiple points of entry for public access. From conducted observation, the sites are either surrounded by solid walls or see-through fences, or a combination of both which becomes the boundary. KLKMC and TSMC have more than one point of entry, whereas S9MC only allow for one. The reason being S9MC area is being allocated out of the reserved forest which is located far away from public intervention. As for the other two, both sites are surrounded by mixed human development particularly KLKMC.

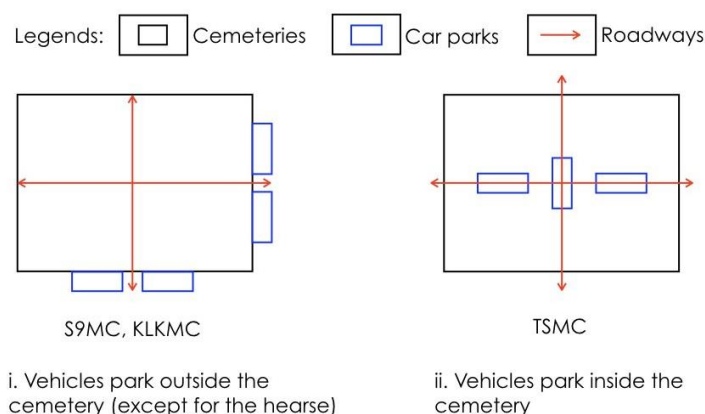


**Figure 03.** Spatial analysis of perimeter for the three case studies

Boundary creates separation between the cemetery and the surrounding area, preventing any possibilities for communication and other social activities to take place within the site. Even though perimeter is essential to indicate the demarcation of the cemetery's area, yet the material used to mark as the boundary should not be separated visually from the public's view. There is no need to conceal the view because it will give a sense of segregation from the outside world. A permeable perimeter at a cemetery is recommended by avoiding the use of solid structures and allow for multiple entrances at the same time.

ii. Accessibility

Integration in the context of the perimeter can be described as the ability of the site to offer multiple points of entry for public access. From conducted observation, the sites are either surrounded by solid walls or see-through fences, or a combination of both which becomes the boundary. KLKMC and TSMC have more than one point of entry, whereas S9MC only allow for one. The reason being S9MC area is being allocated out of the reserved forest which is located far away from public intervention. As for the other two, both sites are surrounded by mixed human development particularly KLKMC.



**Figure 04.** Spatial analysis of accessibility for the three case studies

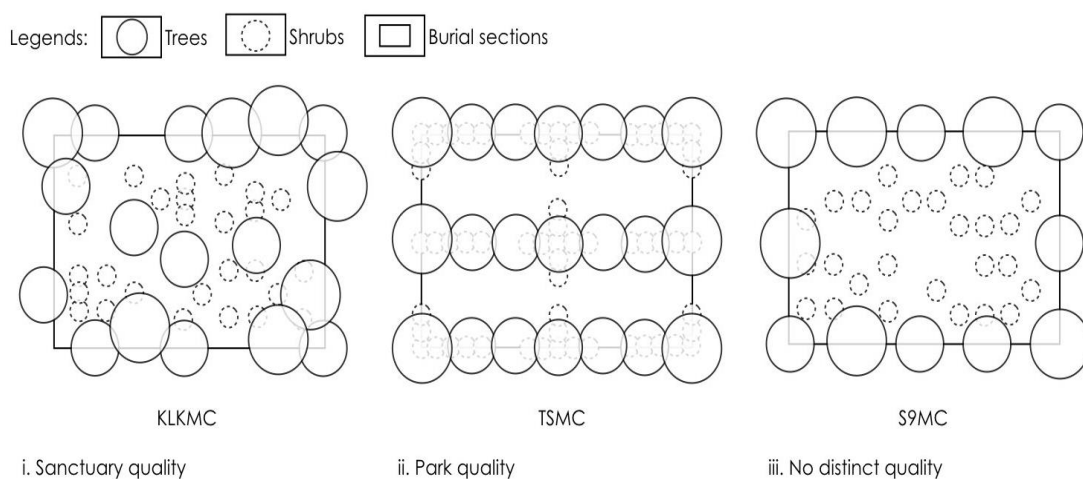
It is a requirement for Muslim cemeteries to have ample parking spaces for visiting the graves. According to PG eight to ten car parking lots and two parking lots for buses are recommended. However, other than estimate the numbers of parking space required for cars and buses at the site, the guideline should

also be concerned about the accessibility of vehicles penetrating every section of the burial ground. Vehicle accessibility into a cemetery should be control but not limited regardless of their category. This is important especially a cemetery with a massive area of burial which would make it harder for the elderly and disable. Instead of providing a specific parking area along the cemetery’s perimeter, visitors should be allowed to park their vehicles along the internal roadway inside the cemetery, which is so much closer for people to make their journey to their graves. Apart from that, the internal circulation for pedestrian users inside the cemeteries deserves full attention from the authorities. If the concept of park cemetery is going to be implemented at public cemeteries, then the pedestrian network must be improved for ease of movement. As what has been witnessed in S9MC, the pedestrian link inside the cemetery’s area is disconnected and has not been given priority.

## 6.2. Conservation

### iii. Plants

Conservation in the context of plants can be described as the ability of the site to promote biodiversity by retaining as much as greenery. This attribute can be interpreted in two ways, which refer to the maturity of the trees and the amount of existing vegetation found at the sites. From conducted observation, KLKMC possesses sanctuary quality whereas TSMC possesses park-like quality due to abundance greenery. Despite being partially surrounded by reserved forest there is no distinct quality found at S9MC because many trees are newly planted hence, they are still not reaching its maturity. Therefore, a reserved landscape at the cemetery has to focus on creating a green network through planting compositions which are going to provide as a corridor for the movement of terrestrial creatures. Clumps of trees serve as a natural habitat to small wildlife and microorganisms at the cemeteries. Furthermore, plants are essential in helping to regulate the local weather and mitigate extreme urban climate.



**Figure 05.** Spatial analysis of plants for the three case studies

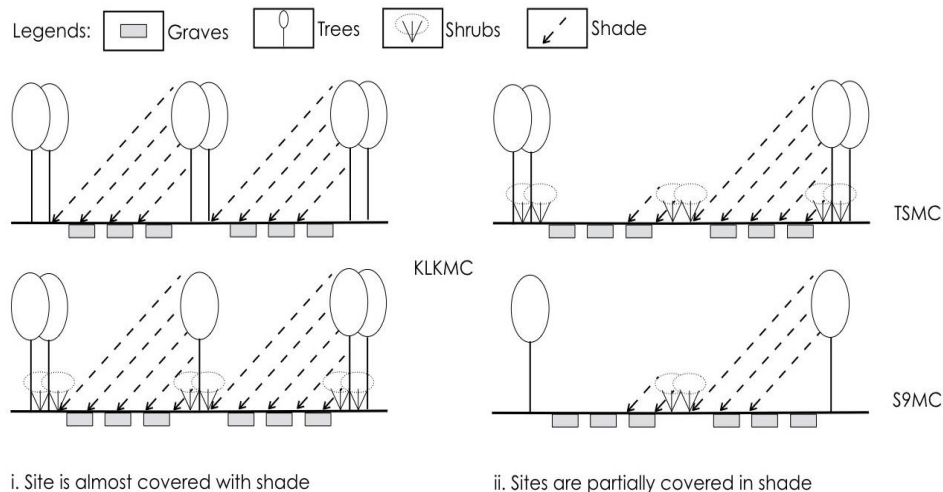
The preparation of the burial ground at cemeteries is the most crucial aspect that should be planned in urban cemeteries. During the site visit to S9MC, the use of machines to dig up the graves has no doubt made the digging work easier than manual labour, as has been practised in KLKMC. However, the use of

heavy machinery in S9MC is only able to be operated where the burial ground is still barren. The landscape features are being added at a later stage after machinery has prepared the grave plots. Nevertheless, different authorities have different ways of following the landscape specification outlines in PG, whether being carried out manually or by machine. Even though JPBD promote beautiful landscapes inside the cemetery area, in the case where machinery is employed there have to be some precautions to avoid damage to the building environment which derives from heavy machines.

S9MC was done in a contradictory way to TSMP where the overall layout of the cemetery is being executed right before burials are taking place. Landscape features in S9MC were laid out after certain burial sections have been fully occupied; for example, pedestrian walkaway, benches and trees. Most of the landscape features are only being provided right after the completion of a certain section of burial plots, including trees planted along the walkway. As a result, people are not going to have a chance to use and experience the space as it was intended to be used. In other words, the landscape features of the cemeteries in S9MC is something that can only be experienced at a later stage. Thus, this practice of developing public cemeteries should be changed.

iv. Sun and shadows

Conservation in the context of sun and shadows can be described as the ability of the site to withstands sunlight exposure and afternoon heat. This attribute is determined by the total area cast under the shadows of trees and shrubs. Here, the term conservation refers to the protection of human comfort by introducing more plants and vegetation at the site. Observation on this attribute covers the trees and shrubs that are being planted within the burial sections and the grave plots. All three sites display the combination use of plants such as trees, shrubs and even palms trees at TSMC. These types of plants are being introduced at the sites for its aesthetical values through landscape design or in some case spontaneously such as in S9MC and KLKMC. The additional green area comes from the numbers of plants that have been planted by the family members involved in tending graves activities. PG should incorporate the projection of landscape area along with the addition of trees and shrubberies that resulted from this practice over the graves.



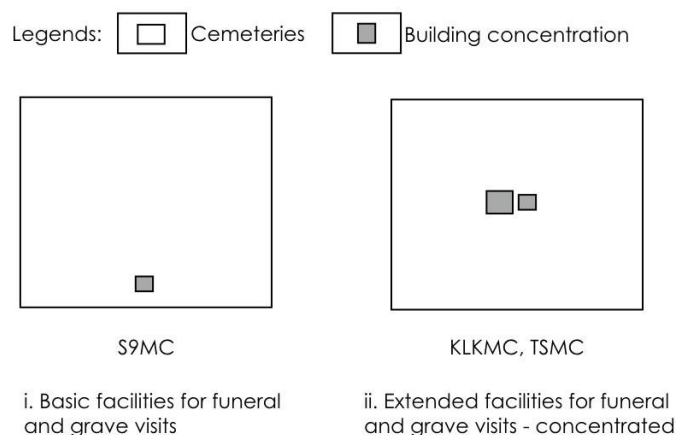
**Figure 06.** Spatial analysis of sun and shadows for the three case studies

Trees can influence and affect people's moods at the cemetery. For example, the abundance of existing vegetation found at KLKMC creates a sense of serenity through shades which also helps to reduce the surrounding temperature. However, the abundance of shrubs over the graves have to be controlled and minimised so that it will not create a sense of loss and confusion due to obstructed vision caused by randomly planted shrubs. Moreover, the reserved landscape for the cemetery has to create a buffer area between burial sections by planting a row of shrubs. As for S9MC, the site is shrouded by clumps of trees which are planted randomly by the visitors over their graves. The site is overly exposed to the sunlight due to further gaps between tree plantings. As a result, the sun heat can be unbearable to visitors, especially during the daytime. In the case of TSMC, there is a balance in controlling the right amount of sunlight that covers the site. The distance between trees planted allowed for the sunlight to penetrate without letting too many shadows cast over the grounds.

### 6.3. Open space

#### v. Facilities provided

Open space in the context of facilities can be described as the ability of the site to provide the visitors' needs for recreation. The facilities here are meant to be used by the visitors and there should be a clear relationship between all the amenities provided. S9MC provides basic facilities, whereas KLKMC and TSMC offer extended facilities to accommodate funeral and grave visits. Apart from providing essential amenities for funeral ceremony's and grave visits, the provision of facilities is crucial which meant to serve as a magnet in drawing people into the site. The concentration of building facilities is affecting people movement and behaviour. A cemetery will not be able to provide the best experience to visitors if there is no certain correlation exist between the position of the buildings at the sites. Moreover, this will become a hindrance for the visitors to navigate their way around. Therefore, the concentration of facilities building at several locations within the cemetery's compound is much preferred than isolated.



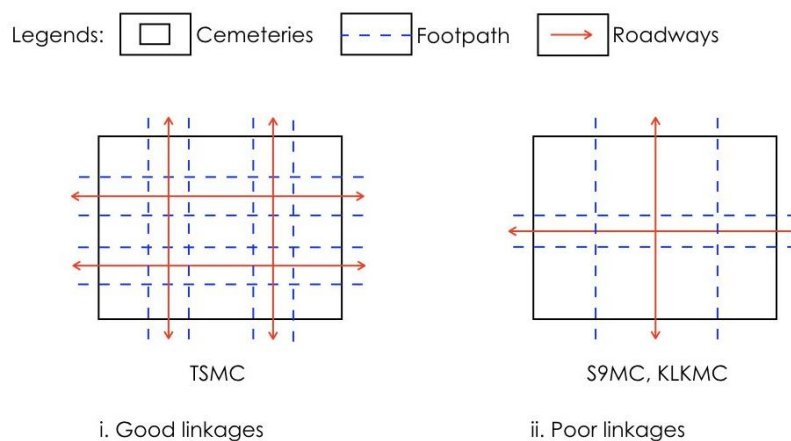
**Figure 07.** Spatial analysis of facilities for the three case studies

PG highlights the provision of a communal building for activities that are related to the management of the corpse as well as the ritual involved in conducting the funeral. Facilities provided at the cemeteries

are primarily for the benefit of visitors. The types of amenities being outlined are very much focused on the user's convenience. However, unlike parks, people do not spend much of their time at cemeteries. People will normally go to cemeteries to perform certain ritual practices. Thus, there is a huge missed opportunity in utilising facilities at the cemeteries for the wider benefit of people. Even though the placement of facilities at the centre of the area is most likely to draw users into the area, however, the amenities will only be neglected and wasted because of the policy that preventing a wider public from entering into the cemeteries. Therefore, it is important to notice that the facilities provided on the site should be used to strengthen the extra function of the cemeteries. In other words, this setting can be described as a magnet that will serve as an attraction to the outsiders.

vi. Spatial connection

Open space in the context of spatial connection can be described as the ability of the site to provide users with a footpath and roadways systems. These two route systems are the most common medium of movement for pedestrian and motorist which help to create a sense of direction and the legibility of site. People movement is pretty much influenced by how good the circulation system is to link between one space to another. TSMC has a connected internal footpath network, whereas S9MC and KLKMC pathway is limited which only allow users to a certain part of the cemetery's area. Vehicle circulation within cemeteries is crucial to ensure people can travelling into the place at ease. Cemeteries could only encourage participation from the public if a good footpath network was being provided. Thus, good linkages can be created by providing a multiple network route inside the cemetery.



**Figure 08.** Spatial analysis of spatial connection for the three case studies

Users and vehicles movement should be encouraged for further exploration of the other sides of the cemetery's area. This is something that needs to be changed to complement the concept of park cemetery which is supposed to encourage access for the public. For neatness at the burial grounds, it is best that the planning of the cemeteries should be approached in a similar way as other development projects in the city, such as residential housing. Proposed master plans should be prepared in detail along with the phases of development for completion of the project, especially if it involves a large site such as KLKMC.

## 7. Conclusion

It is assumed that JAWI and MAIWP will be paying much attention to improve the management of Muslim cemeteries within the Kuala Lumpur metropolitan area. Nevertheless, this continuous effort will be depending on the JPBD's newer guideline (CCPG), which is still in its the draft phase. JPBD should seriously ameliorate several aspects of CCPG by incorporating sustainable design practice into the guideline. CCPG should entail the characteristics that cemeteries should exhibit in attaining the state of being sustainable. Currently, the set of guidelines outlined for urban cemeteries in CCPG are too generic and some parts require further clarification. The centralisation of communal facilities as a concept within the burial area is exceptionally desirable to achieve sustainable development inside public cemeteries. However, with the integration of the park cemetery as part of the concept for public cemeteries, the amenities provided on the site will be able to benefit a wider number of users from outside the area. Finally, in terms of the provision of reserved landscape and pedestrian walkway at the site, authorities are encouraged to treat the development of cemeteries in a similar way to other construction projects. With the introduction of the park cemetery, it is expected that the site will be able to be used by the public after it is completed. However, this was still not the case in some cemeteries such as S9MC where the construction of hardscape and softscape is being done in phases along with the completion of the burial section.

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