Light Art for Historical Buildings: A Case Study of the Heritage Buildings in George Town, Penang Island

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Abstract

Light art has been used for heritage buildings to express their cultural, historical and visual importance. But what was needed for the buildings and what was initially required? These are the main issues, which surfaced when our urban architecture became more influenced by state-of-the-art aesthetics than ethics in conservation and professional conduct. The objectives of this paper are to outline the features of light art used around George Town – a UNESCO World Heritage Site – and to raise questions on how to strike a balance between aesthetics and ethics in its design. The observations done around George Town led to more specific branches that define light art for historical buildings, aesthetics, the quality of light and building conservation. It is quite obvious that designers must balance design sustainability with technical sustainability by fully expanding the spectrum of the design's aesthetic, historical and functional needs.

Keywords: lighting; historical building; building conservation

1. Introduction

The lighting industry has evolved tremendously into what it is today. In terms of technology, however, it is a regular development over 15 years. The lighting technology used in historical structures is no exception – buildings are being used as illuminated decorations against the night sky. But in which direction is the development heading in fulfilling the needs of the city in terms of its social context and building conservation? What should designers be
aware of before implementing lighting design plans in historical buildings? Further to this, the researcher will also highlight and discuss the need for light art in historical buildings around Georgetown within the context of conservation, society and urban architecture.

1.1. Research Background and Framework

This study focuses on light art used for historical buildings located in George Town, on the Malaysian island of Penang. The topic was chosen because from the researcher’s personal observation, much too little study has been done on the lighting of historical buildings. Such structures have unique aesthetic values in its architecture and its ancient building materials – some of which may no longer be in production – that need to be highlighted. The researcher has linked the requirement for conservation in light art (other than aesthetics) with the extent to which the lighting has followed UNESCO’s guidelines. This study also looks in detail at how these guidelines and stipulated policies are implemented in terms of ethics and professionalism. Are more detailed guidelines used for illuminating historical buildings? These are the issues that the researcher will put forth in this study. Due to the lack of research in this area, however, additional issues have emerged and will be addressed in this study.

1.2. Artificial Lighting

Night-time artificial lighting does not only recreate the splendour of ancient structures around a city but also provides a refreshing view of the urban architecture and its surroundings. The art of artificial lighting also provides visitors with a welcoming and secure ambience. When strategically configured, lighting effects in cities can attract and persuade people to meet, interact and get together. In fact, we can boldly say that the art of lighting may have a role in shaping the future of a city. Large cities tend to highlight the aesthetic features in the architecture of a building by using artificial lighting. George Town in Penang, a city that has attained UNESCO’s Heritage City status, has also been subjected to artificial lighting and has been studied by the Penang state government in their working plans.

![MAP OF PENANG](https://www.world-heritage-site.com/pulau-penang)

Fig. 1. Georgetown, Penang Island.
According to Shielke (2007), images created by light are a medium for designers to evoke inspiration, evaluate concepts and visualise ideas. Designers also use lighting and light art to enhance the exterior of historical buildings around a city to upgrade it into night-time tourist attractions. But how successful is the resulting image, achieved through night-time lighting on these historical buildings, within the social context? What about its success in terms of conservation? These are the two conflicting areas in the two professions today. Designers naturally love utilising light art in historical buildings. However, we often see that the final product looks rather extreme and defeats its original purpose. The buildings seem to be begging for the attention of tourists and other passersby. Friebe (2007) stated that artists have opened people’s eyes to a new way of comprehending things and relationships because lighting design has played a more or less subordinate role in architecture. This suggests that the effect of lighting is regarded as increasingly important in presenting a building as an object of art.

The researcher does not deny the importance of the art of night-time illumination of historical buildings in George Town. It stimulates the local economy and fulfils a social need. Nevertheless, we should recognise its positive and negative impacts on users. Its positive impacts have been mentioned earlier. The negative impacts affect our biological system, particularly when the quality of light used at night does not meet our health requirements (Funk, 2007). In other words, the designer should focus on both quantity and quality in their application of night-time illumination as it has adverse effects not only on the historical buildings but also on users’ physical and psychological welfare. Many of us in this country are not aware of this, or rather, are not educated about it. Boivin (1996) and Czeisler CA (1989), in their article on light and the human circadian rhythm, stated that when bright light is administered during the evening hours, it seems to cause a desynchronized pacemaker effect, leading to negative health-related consequences, such as profound impacts to the cardiovascular system and the kidneys.

Lighting, however, is not limited to only a single field or theory, but is rather a seamless synergy between the designer’s skill, technology and medical effects.

1.3. Conservation Management Plan (CMP) and Special Area Plan (SAP)

The Conservation Management Plan (CMP) and Special Area Plan (SAP) documents were updated by the Malaysian government and sent to the World Heritage Committee, UNESCO to request for George Town to be awarded the status of Heritage City. The documents were pre-signed by Dato’ Seri Utama Dr. Rais Yatim, the Minister of Information, Communication and Culture Malaysia on 21 January 2011 for the state of Malacca and the city of George Town on the island of Penang. Several matters related to the application of lighting on historical buildings in Malacca were listed. However, the researcher found that its contents under artificial lighting only skimmed the surface broadly. Very little was mentioned about its context, quality and other technical aspects. Did the parties involved in illuminating the historical buildings in George Town actually adhere to the guidelines or did they just want to get the job over and done with? The researcher would also like to question a more critical issue in this study, which is the effect of night-time lighting on our health, how light can promote health and at the same time, how the layout of lights on historical buildings can enhance performance and learning of the general public. All of these are interrelated and encompass several fields of expertise.

The Conservation Management Plan (CMP) and the Special Area Plan (SAP) were approved by Dato’ Seri Utama Dr Rais Yatim, Minister of Information, Communication and Culture Malaysia on 21 January 2011. The documents were sent to the World Heritage Committee, UNESCO and Georgetown were subsequently granted the status of Heritage City. In section 8.4 of Annexure A within, “Guidelines for the Conservation Areas and Heritage Buildings (Malacca)”, under 8-7, these five guidelines were given:

- Illuminating heritage buildings must be carried out with extreme care, to avoid both ugly and damaging installations.
- Drilling holes through walls in order to provide power supply, and installing light fixtures all cause damage to heritage buildings and should be kept to a minimum.
- Once installed and running, the build-up of heat from lights placed too close to the building is likely to cause damage. Lighting should be considered with this in mind.
• Traditionally, the lighting would have been at the ground floor entrance, on the five-foot path of shop-houses or the porch of bungalows.
• Colour lighting, whether static or rotating, is not permitted.

The government has also recommended that lighting is installed according to the guidelines are given in Section 8.4.1, among which are:

• Strings of light bulbs attached to a building, e.g. around windows and cornices, etc., are not permitted.
• Spotlighting of buildings should be kept to a minimum, subject to approval on a case-to-case basis.
• Floodlighting of buildings should be unobtrusive and set within the landscape, not attached to the building.
• Floodlights used on buildings must be natural white light.

The above guidelines only superficially address conservation. There are no detailed guidelines on the light content itself or its impact on historical buildings. Specific features were not mentioned in the documents. These will be discussed in the findings and discussion below.

2. Findings and Discussions

To our naked eyes, it seems that light art has managed to draw attention to the aesthetic values of historical buildings in George Town. However, how well has urban lighting design integrated with the building in terms of ethics and professionalism? In the researcher’s opinion, its physical features can no longer be considered to have achieved its objective. Light art for historical buildings must be evaluated comprehensively using other variables. To this end, the researcher shall examine the two main aspects, namely building conservation and social context, by exploring what is defined as a good lighting design.

Ahmad, a professor of Building Conservation at Universiti Sains Malaysia, Penang explained during an interview to seek an answer to this issue that there are indeed no details regarding the usage of lighting for historical buildings in Malaysia. Ahmad, who is on the committee that reviews the Conservation Management Plan (CMP) and Special Area Plan (SAP) guidelines, strongly agrees that the guidelines need to be refined using views obtained from lighting experts. In his opinion, lighting techniques employed for urban architecture in the city of George Town comply with general guidelines but the more detailed aspects of lighting must undergo internal evaluation by the parties involved. He added that general guidelines tend to be more physical and practical in nature because the specific guidelines are technical though this area still lacks the required expertise. Ahmad does not dispute the fact that night-time illumination of historical buildings lends them an aesthetic aura, at the same time educating the public and tourists on the magnificence of historical architecture. The mood created by the layout of the lights is merely an accessory, an added attraction.

The researcher personally feels that the requirements stipulated by the guidelines remain unfulfilled by developers. Powerful spotlights continue to be used. Various incentives may be introduced to overcome this problem. Certainly, several different fields of expertise need to be leveraged. Manuals on lighting formats need to be reviewed to determine features of historical buildings that should be highlighted and the factors that must be taken into account in implementing a lighting design to fulfil social and conservational needs. Designers need to understand the importance of the concept of motivation of light and colour to ensure that its effects are appreciated by the public.

Sustainability is at the heart of everything. Products used on historical buildings must all be accompanied by an Environmental Product Declaration (EPD), be relevant as well as comprehensive, and provide information about its impact on the surroundings. Energy consumption needs to be calculated, using as a benchmark the EN 15193 standard used in Europe, which is the Energy Performance of Buildings: Energy Requirements for Lighting. Even though Europe applies it, a relevant body in this country should be appointed to reassess the standard for local application. In addition, lighting control would be the simplest proven method to reduce energy consumption, through the usage of outdoor photocells, traffic detection, dimming and absence/presence detection. Malaysia is a developing country and to achieve healthy development in the field of lighting, energy efficiency and environmental
measures, such as using low-energy lighting products, are important. One way to do this is by using modern light sources that are capable of achieving energy savings of up to 50 percent.

What about the quality of light? What about the colour temperature produced by incandescent, fluorescent, LED and other lamps that can result in extreme contrast and glaring effects when not used appropriately in the evening hours? Light of certain wavelengths creates an effect on a building’s materials, producing a reflection that indirectly and adversely impacts the health of night visitors who come to admire the building. This gives rise to yet another issue, which concerns health.

Fig. 2. City Hall is a building in Georgetown.

Fig. 3. City Hall is a building in Georgetown.
Designers today appear to be obsessed with perfecting the lighting effect on historical buildings. However, we must consider that shadows also have a role in drawing out the aesthetic values of buildings through lighting design and light art. Since George Town has historical buildings along the seafront, designers should re-evaluate the structures and locations of these buildings when planning their lighting formats for daytime, twilight and night-time. The result would be different if designers had solely depended on artificial lighting. For example, the City Council building, situated close to the seashore and facing a wide, open field, is never short of visitors. The colour of the spotlights illuminating the building is now based on the muted palette of a setting sun. This gives visitors the special experience of appreciating the transition from day to night more effectively than before. Although a coloured light is discouraged, designers may still experiment with the colour temperature of white light by using a digital controller to adjust the brilliance of LED lamps in order to highlight a building’s facade.

There is a pedestrian’s path in Padang Kota lined with historical relics left by the British, interspaced by lush trees along the pavement facing the sea. This is an important visitor’s attraction. During the day, trees in the area provide shade to the pedestrians. Stalls set up by hawkers generate income for the residents. At night though, the researcher found that visitors avoid passing through the area due to the lack of lighting. Designers could re-look at the walkway and come up with a lighting design concept that will allow visitors to enjoy the open space and feel that they are in a secure environment. To realise this, colour, interactive benches, patterned light created using mystical elements and symbols, and a subtle yet dramatic effect from local culture can be added to keep visitors feeling entertained, comfortable and safe.

3. Conclusion

From the discussions above, the researcher can draw a conclusion with the following question: What are the characteristics necessary to successfully implement “good” light art projects for historical buildings in George Town? The answer is rather complex. In general, the layout of lights alone is not sufficient to make a building aesthetically pleasing. An analysis of the surrounding area needs to be carried out and the illumination of historical buildings needs to be planned comprehensively, by taking into account how the building interacts with its surroundings, and then expanding the concept of lighting to cover this larger scope. In other words, which part needs to be illuminated and which architectural element should be left dark? Next, the designer ought to try and explore every possible technical solution, including its calculations, luminous efficiency and energy savings, by studying the conservation guidelines, the quantity and quality of light (including the contrast between lightness and darkness) as well as the colour of light (if necessary). Visual comfort and glare are two priority areas that must be addressed. Designers cannot ignore the responsibility of educating themselves about the medical, environmental and biological factors that hugely impact not only humans but other creatures as well. If these points are not given due attention, future designers face the danger of ignorantly using the lighting design we see today as a source of inspiration, without regard to the critical aspects presented above.

References