UNIVERSITI TEKNOLOGI MARA

FACULTY OF ARCHITECTURE, PLANNING & SURVEYING

BACHELOR OF BUILDING SURVEYING (HONS)

UITM SERI ISKANDAR

PRACTICAL TRAINING REPORT

(BSR 666)

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(2018222198)

BACHELOR OF BUILDING SURVEYING (HONS)

THE BUILDING MAINTENANCE MANAGEMENT IN IXORA HOTEL, PENANG MALAYSIA FOR LIGHTING SYSTEM

JANUARY 2022

CENTER OF STUDIES IN BUILDING SURVEYING
FACULTY OF ARCHITECTURE, PLANNING AND SURVEYING
UNIVERSITI TEKNOLOGI MARA SERI ISKANDAR PERAK

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This practical training report is fulfilment of the practical training course.

PREPARED BY

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DATE : 26 JULY 2021

SIGNATURE :

ACKNOWLEDGEMENT

In the name of Allah, the Most Gracious and the Most Merciful. All praises to Allah and His blessing for the completion of this report. I thank God for all the opportunities, trials and strength that have been showered on me to finish writing the report. I experienced so much during this process from the academic aspect. My humblest gratitude to the holy Prophet Muhammad (Peace be upon him) whose way of life has been a continuous guidance for me.

First and foremost, I would like to sincerely thank my supervisor Sr. Dr Nur Azfahani bt Ahmad for her guidance, understanding, patience and most importantly, she has provided positive encouragement and a warm spirit to finish this report. It has been a great pleasure and honor to have her as my lecturer.

My special gratitude goes to Mr. Rosli Bin Ishak @ Mohamed, Manager of Engineering Department, for his modern outlook and meticulous supervision to carry out the job perfectly, and all other departmental heads, officials, and also all office staffs in maintenance department for their sincere co-operation and support for giving me the opportunity and always help and support me for making a standard report.

My deepest gratitude goes to all of my family members. It would not be possible to write this report without the support from them. I would sincerely like to thank all my beloved friends who were with me and support me through thick and thin. There give a support and willingness to share information and spend some time with me.

I also want to extend to all those who helped me in many ways with my report. I am very grateful that I can managed to complete this report within the time given by my supervisor. Thank you again for their help and support in the administrative works.

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CHAPTER 1

COMPANY BACKGROUND

1.1 INTRODUCTION

Practical training is part of all the Bachelor's degrees completed at the universities. Practical training is defined as learning that takes place in a firm or business and allows the student to apply what she or he has learned in the classroom to practice and grow professionally. Practical training must be well-planned and monitored because it is part of the student's academics. Students also can apply all of the methods and abilities they gained in class last semester to use. This technology and skill set may be used to their training, resulting in increased corporate performance.

As a result, the students' chosen practical training was given a total of 16 weeks. Students can choose from a variety of training locations, and they can be in either public or private companies that perform building control, building works and appraisals, facilities management and maintenance, development and construction management, heritage and building conservation, or insurance/risk management.

Each student in the organization is overseen by experienced professionals who are in charge of instructing pupils as well as monitoring their attendance, discipline, and performance. As a result, this will be documented in the university's student assessment report. For the practical training phase, competency targets are set. Practical training must give students with goals-aligned tasks as well as job advice. Practical training is linked to the student's field's curriculum and learning process, and it can be conducted in Finland or abroad. Students with practical experience have an easier time finding work after graduation.

1.2 Overview of Ixora Hotel Sdn. Bhd

Figure 1.1: The view of Ixora hotel Sdn. Bhd (Source: Google Image)

The Ixora Hotel Sdn Bhd is a famous 4-star hotel in Penang's Prai district. The Ixora hotel is located in 13600 Perai Pulau Pinang, Jalan Baru Bandar Perai Jaya. Its proximity to the Megamall Penang makes it even more convenient. It's a city center hotel at a good location with easy access to public transportation. The Ixora Hotel is conveniently located next to a variety of stores, restaurants, and cafés. Industrial parks like as Prai Industrial Park, Bukit Tengah Industrial Park, Kulim Hi-Tech Park, and Bukit Minyak Industrial Park are also close by. It will be a very handy location for both business and recreation. The Penang Bridge connects the hotel to the Bayan Lepas International Airport, which is only a 20-minute drive away. Dato Seri Lim Guan Eng founded this hotel in December 2011. The hotel also features 326 rooms, a stairwell café lounge, and meeting and event facilities.

Figure 1.1: Ixora hotel Sdn. Bhd official logo (Source: Google Image)

1.2.1 VISION AND MISION

1.2.1.1 VISION

“Ixora hotel vision is to have dedicated staff to be the leading hotel in this area.”

1.2.1.2 MISION

“Ixora hotel mission is to have dedicated staff to be the leading hotel in this area.”

1.2.2 KEY PLAN OF IXORA HOTEL.

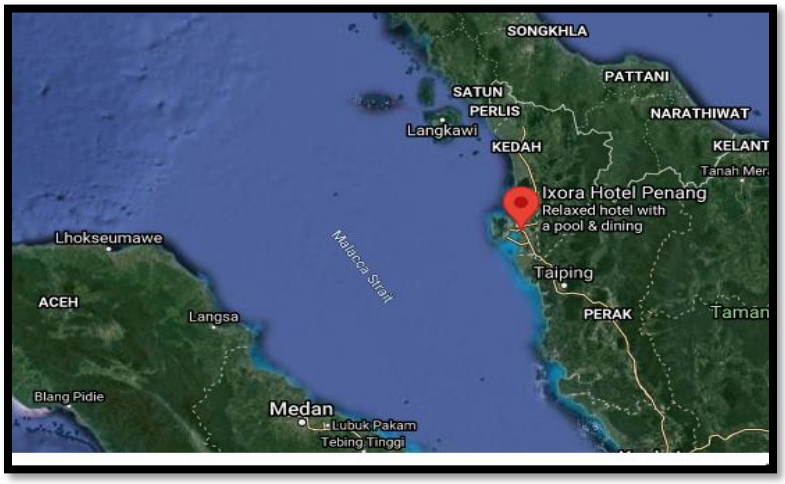


Figure 1.2 Key Plan of Ixora Hotel Prai, Penang. (Source: Google Map)

1.2.3 LOCATION PLAN OF IXORA HOTEL.

The Ixora hotel is located in 13600 Perai Pulau Pinang, Jalan Baru Bandar Perai Jaya.

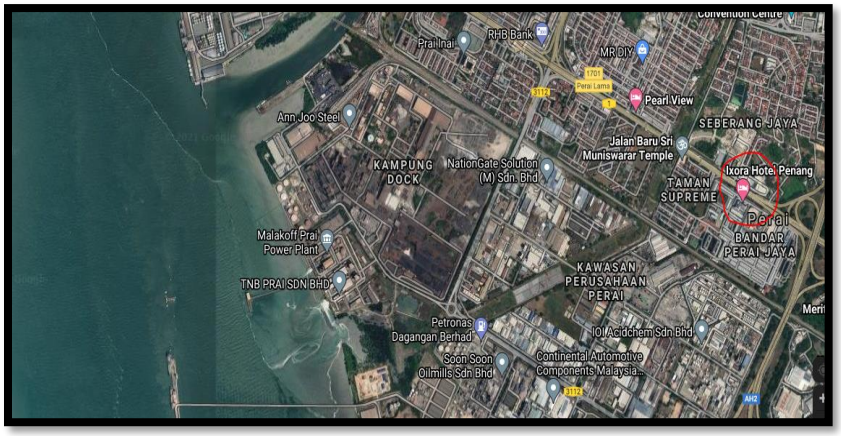


Figure 1.3 Location of Ixora Hotel Prai, Penang (Source: Google Image).

1.3 ORGANIZATION STRUCTURE

1.3.1 BOARD OF DIRECTOR

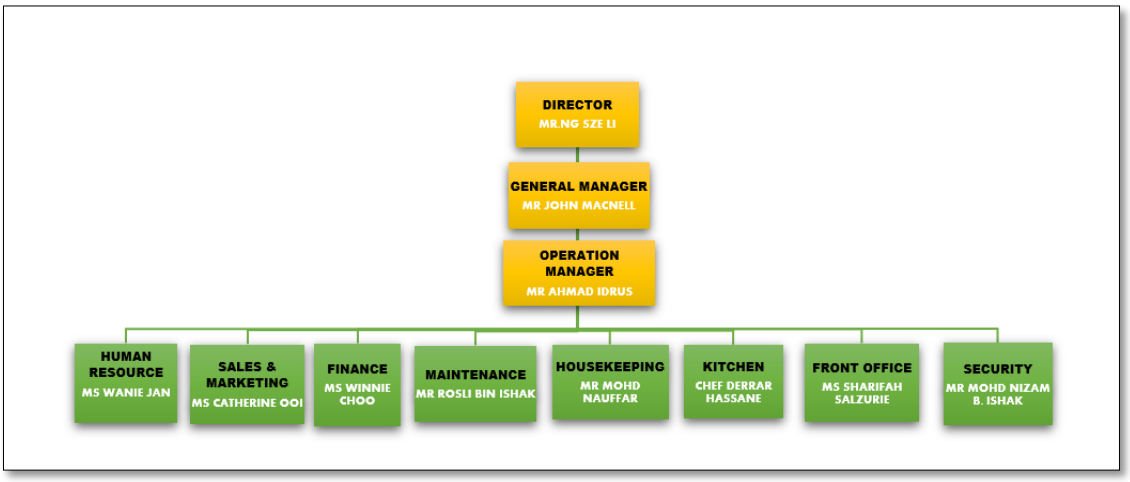


Figure 1.3 Board of Director of Ixora Hotel

1.3.2 MAINTENANCE MANAGEMENT TEAM

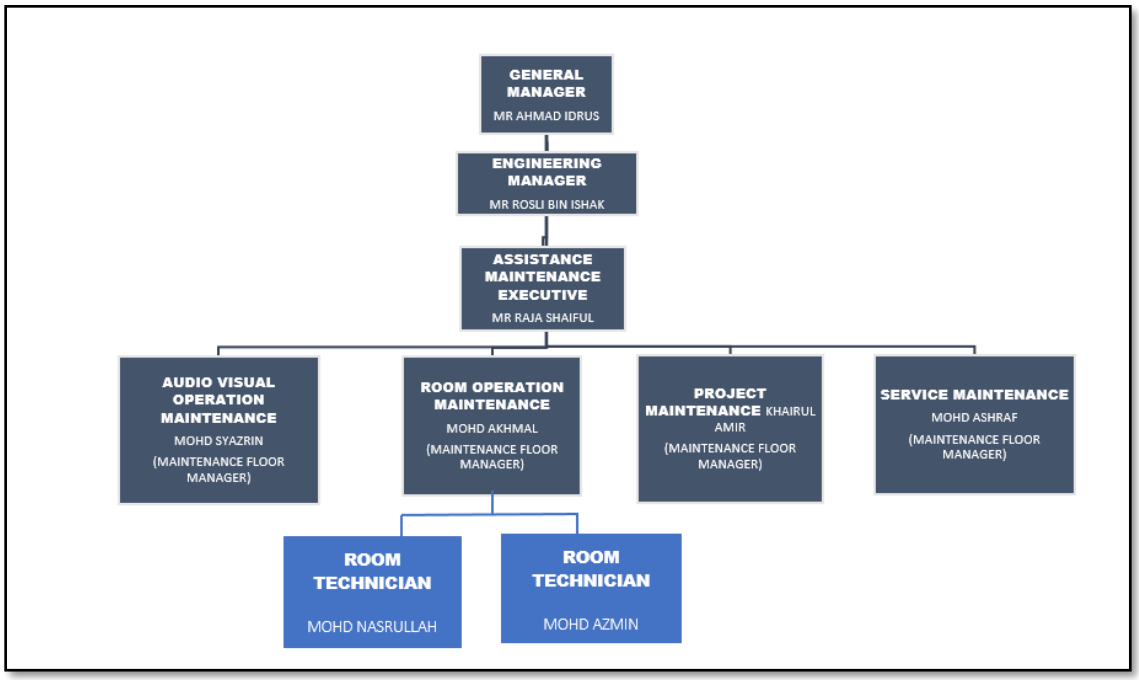


Figure 1.3 Maintenance Management Team of Ixora Hotel

1.4 MAINTENANCE DEPARTMENT PREVIOUS PURCHASE

NO	Date Request	PR NO	Item Request	MT	KT	FO	FB	HK	STATUS	REASONS
1	7 Jan	112544	Repair coffee machine faulty				**368.00**		Approval	Strait café
2	7 Jan	112545	Supply & install Omron relay MKS2P Relate 240VAC+ BASE		140.00				Approval	Café kitchen
3	7 Jan	112546	Repair blower fan motor walk in freezer		1,450.00				Approval	Banquet kitchen
4	7 Jan	112547	Repair deep fryer internal terminal & chip		285.00				Approval	Café kitchen
5	7 Jan	112548	Replace cooling fan motor & drain heater for 4 door freezers		670.00				Approval	Café kitchen
6	7 Jan	112549	General servicing air blast burner stove & repair tilting pan.		310.00				Approval	Banquet kitchen
7	7 Jan	112550	Repair 2 door counter freezer						Approval	Bar counter
8	7 Jan	112551	Repair head fire brick in surface iron plate int bracket air blast		1,750.00				Approval	Café kitchen
9	7 Jan	112552	Supply & repair material walk in freezer (compressor motor)		4,500.00				Approval	Banquet kitchen

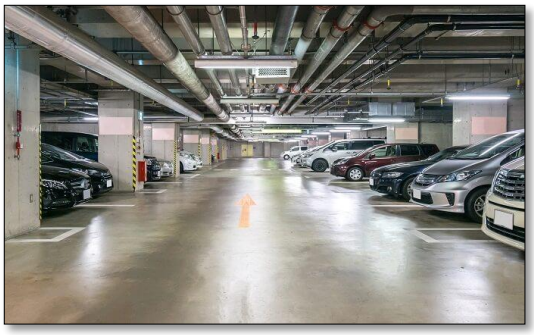
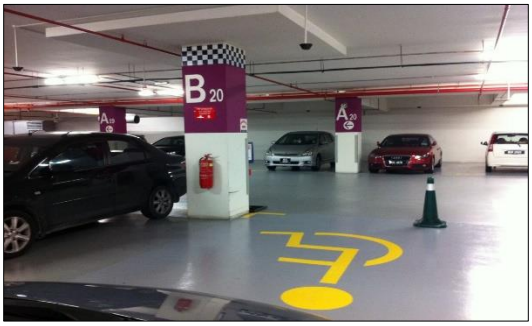
10	9 Jan	112650	Anchor spray paint white	84.00					Approval	For fan blade café
11	9 Jan	112651	Knead and underwater & strong epoxy fix (sellers)	66.00					Approval	For children pool
12	13 Jan	112807	Supply & install mid steel chafing dish bracket		950.00				Approval	Banquet kitchen
13	20 Jan	113252	320 sw allow sand paper	48.00					Approval	For stock
14	20 Jan	113251	2hp compressor-TS33VAEC			1,641.00			Approval	For 515 and L9 lift ¾
15	20 Jan	113250	R22 chlorodifluoromethane liquified gas	920.00					Approval	For a/c stock
16	20 Jan	113249	Capillary tube 2hp/1.5 hp, coil cleaner 6711, silver copper rod	375.00					Approval	For replace 719
17	21 Jan	113266	2.8 hp compressor-THK33PO6-U			683.10			Approval	For server room ac
18	22 Jan	113307	Service 2hp mounted wiring & outdoor unit	190.00					Approval Approval	Pastry kitchen
19	22 Jan	113308	Replace 3-unit open burner plot thermo couple		555.00				Approval	Café kitchen
20	22 Jan	113309	Replace temperature controller 4 door upright		485.00				Approval	Banquet kitchen

NO	Date Request	PR NO	Item Request	MT	KT	FO	FB	HK	STATUS	REASONS
21	22 Jan	113310	Replace thermo controller & internal wiring tilting fan		775.00				Approval	Banquet kitchen
22	22 Jan	113311	Monthly service charges for the fire protection system	600.00					Approval	Fire alarm safety
23	22 Jan	113312	New blower fan motor for irony Kory stove		1,550				Approval	Banquet kitchen
24	22 Jan	113316	Flushing system fitting WGFT410178XXFtg TF85DF	770.00					Approval	For toilet stock
25	23 Jan	113320	1.5 hp compressor Matsushita (2PS206D2A F02)	799.20					Approval	For toilet stock
26	30 Jan	113530	T8 LED Tube, isolator, transformer, plug top, terminal block	1,435.81					Approval	For stock
27	2 Jan	112294	Repair & cleaning canopy				3,300		Pending	For outside café
28	13 Jan	112804	Install automatic screen & panel bracket, ceiling manhole.				3,900		Pending	For baba ballroom
29	29 Jan	113497	Alloy corner guard (45×20×600mm)			72.75			Pending	For entrance staircase
			Total	5,288.01	13,420.00	2,396.85	9018.00			750,126.11

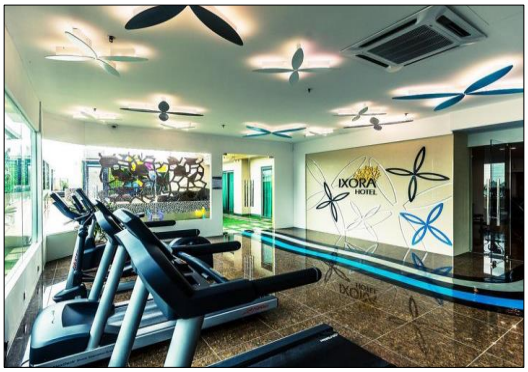
1.5 BUILDING SERVICES & FACILITIES

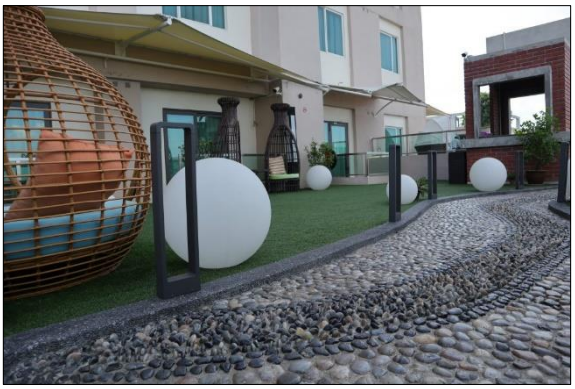
This section lists all of the services available at the Ixora hotel in Penang. It refers to portions of a service that do not alter over time, such as circulation spaces, staircases, escalators, lifts/elevators, and motor rooms, as well as fire refuge areas, maintenance rooms, and other similar locations. This section also supplied facilities in the region of the hotel for the convenience of the guests.

Table 2.1: Services and facilities in Ixora Hotel

NO.	DESCRIPTION	PHOTO
1	**PARKING** An underground parking garage has no floors above ground and none below. Underground parking garages are most commonly found in city centres where there is limited space to build a parking facility but a great need for one. The ixora hotel additionally give the underground parking (B1 and B2 floor) because the space is restricted outside the building. It also contains a park dedicated to the OKU.	 
2	**AIR CONDITIONING SYSTEM** Centralized air conditioning units are fitted to the ceiling to provide fast and effective cooling in large spaces. This building is using this kind of AC system mostly.	

3	**CCTV SYSTEM** It is the most important room which is, bringing together video surveillance from CCTV system, access control and fire control into one room. It serves as a central space where a large physical facility or any service can be monitored and controlled by security guards. This hotel used the type of dome CCTV camera.	 
4	**ACTIVE FIRE PROTECTION SYSTEM** It is a system of equipment used to prevent, extinguish, localize, or block fires in enclosed spaces. As we can see in the photo, there are: • Fire Control Panel • Sprinkler • Horse Reel • Fire Extinguisher	   

5	**PASSIVE FIRE PROTECTION SYSTEM** Passive fire protection divides the structure into compartments and prevents fire spread by using fire-resistant walls and floors. It's also included system such as stairs, fire resistance door and others.	 
6	**LIFT** It moves in a vertical shaft to carry passengers or freight between the levels of a multistorey building. There are total of six lifts provided in this building. All the elevator used in this building was made by Mitsubishi Electric.	
7	**GYM** Here in this gym is the place where our guests can maintain their body mass and fitness levels. It has a range of machines and tools for our gym junky guests to pump iron and run their miles on the treadmill. Never skip a day of workout when used the gym at Ixora Hotel Penang. The hotel also provides fresh apples every day and water provided at the gym for guest to have a quick energy boost.	 *(Source: Google Image)*

8	**LIGHTING SYSTEM** There are many types of lamps used in this building for the lighting system. It is based on the location and size of area. Types of lighting system used in this Ixora hotel are: • LED Ceiling Lamp • Pendant Lamp • Wall Mounted Lamp	   
9	**GARDEN & REFLEXOLOGY TRAIL** Here at Ixora Hotel Penang provide a spot for our guests for relaxation and fresh air at the garden and reflexology trial. Nothing feels better than a good read in the garden and a walk on the reflexology trail. The reflexology trail provides multiple benefits to the body and organs as the pebbles massage the various pressure points under your feet. The reflexology trail can be used to bring fitness to the body, by increasing flexibility and response capability, help in the treatment of osteoporosis, relieving back pain and enhance cardiovascular function.	

10	**SWIMMING POOL** Ixora Hotel Penang would not be complete without a swimming pool. Right next to the garden is the swimming pool, our swimming pool boasts an infinity pool architecture, leading out to a wonderful scenery of the townscape. Swimming at any time of the day can provide you with various health benefits like building endurances of the overall body as well as building your cardiovascular strength. Swimming also tones the muscles and gives strength to the swimmer.	 *(Source: Google Image)*
11	**MASSAGE CHAIRS** After a long day of walking and exploring what Penang has to offer, nothing is more relaxing than a session in the massage chair. The massage chairs are located on the 1st floor outside the function halls and are open to usage for our guests at any time of the day. Massage chairs may help realign your spine and relieve the pressure on the nerves, it relaxes your muscles and helps you maintain a good posture as well. Feel the stress roll off your back and shoulders with the massage chairs at Ixora Hotel Penang.	
12	**FUNCTION ROOM** Featuring the largest event floor of over 3200 sqm in northern region, Ixora Hotel Penang is the perfect destination for your conference events. We have five (5) thoughtfully-appointed meeting rooms, one (1) press room, two (2) ballrooms and large pre-function area to perfectly host your events in Mainland Penang. Whether large or small conference meeting, we are committed to provide you the hassle-free venue hire with simply extraordinary element. We also offer a range of Audio Visual, high-speed internet access and presentation aids	 

CHAPTER 2

INTRODUCTION OF LIGHTING SYSTEM

2.1 DEFINITION AND CONCEPT OF LIGHTING SYSTEM

The technical wiring required to deliver electricity for light fixtures is referred to as light points. ACE+ has qualified electricians on staff who can help with the installation and maintenance of your property's light points. The wiring for lighting and domestic gadgets must be done individually. This is so that lights can be run on a separate circuit and protected by a separate RCD. The wiring that provides electricity to the light fittings passes through light points. If an issue with the wiring arises, it might have a cascading effect, preventing other lights from operating, (Fowler & Miles, 2002).

The building layouts are usually taken into consideration while installing light spots. Light points, on the other hand, are frequently left with room to expand. It is critical to get the advice of a fully competent electrician when installing new light points or expanding the capacity of existing light points. Light point wiring is of good quality, and because it is inside, it is not overly exposed to the weather. It will still be subjected to wear and tear as a result of daily use, which is why we recommend testing and maintenance on a regular basis, (Ghani et al., 2008). After the installation, our staff will test the light spots to ensure that they are in good working condition and double-check the placements and switches. We don't consider a project finished unless the consumer is completely satisfied.

When it comes to installing light points, the sort of lighting you select will determine where the wiring is installed. For example, wall-mounted lighting needs inner-wall wiring. The location of the light switches, as well as whether a switch will control individual lights or a cluster, are the next things to consider. With so many possibilities, it's easy to see how hiring a professional might help you avoid difficulties down the road.

Minor concerns might turn into major concerns if your light points aren't examined on a regular basis, (Tremblay, 2013). Electricity should never be taken lightly, and damaged wiring can quickly result in fires or serious harm. Our experts can do planned maintenance at your house on a regular basis. Our electricians are trained to test and detect problems so that they may be fixed before they become costly concerns, (Safety, 2008). A frequent visit from the ACE+ team can provide you with the assurance that your family and possessions are protected.

2.2 GENERAL TYPE OF LIGHTING SYSTEM

Proper lighting can make a big difference in how you feel in a room, and each area may have its own set of lighting requirements, (DiLaura et al., 2018). A good lighting arrangement mixes several types of illumination to create a welcome environment in can work or rest effortlessly. In order to do this, overlay three main forms of lighting in a room:

- Ambient lighting
- Task lighting
- Accent lighting

Ambient Indoor Lighting

The goal of general lighting, often known as ambient lighting, is to illuminate a whole room(Hammer, 1995). It offers a consistent degree of illumination across the area, regardless of the presence of additional lighting sources. Furthermore, it serves to ensure safe and smooth circulation as well as provide a general perspective of the space. The ambient light 'bounces' off the walls, filling the room with brightness.

Types of fixtures that can provide general ambient indoor lighting:

- Chandelier
- Ceiling mounted fixture
- Wall mounted fixture
- Traditional recessed fixtures and / or LED downlights
- Track light
- Floor lamp
- Table lamp

Figure 2.2: The Ambient Indoor Lighting (Source: Google Image)

Ambient Outdoor Lighting

Outdoor lighting is typically used to improve visibility and security around a structure (Hussin et al., 2013). It is also advised that the building's outside, doors, and staircases be illuminated to lessen, if not eliminate, the danger of harm when entering and exiting the structure.

Types of fixtures that provide ambient outdoor lighting:

- Spotlight
- Hanging fixture
- Garage and canopy lighting
- Post lantern
- Wall lighting
- Recessed fixture used in overhanging structures

Figure 2.2: The Ambient Outdoor Lighting (Source: Google Image).

Accent Lighting

Accent lighting is primarily used to draw attention to a particular area of interest or to generate a desired effect. This lighting creates the illusion of a larger space. It's more commonly employed to draw attention to an architectural element, a plant (in an outdoor setting), a sculpture, or a grouping of artefacts. As a general rule, effective accent lighting necessitates the installation of lighting that is three times brighter than ambient lighting (DiLaura et al., 2018).

Types of Fixtures that Provide Accent Lighting:

- Track light
- Slim line bar and undercabinet
- Tape and extrusion
- Directional recessed fixture or downlight
- Wall-mounted fixtures

Figure 2.2: The Accent Lighting (Source: Google Image)

2.3 THE SIGNIFICANCE OF LIGHTING IN BUILDING ARCHITECTURAL.

Lighting is the foundation of architectural buildings. It can change the perception of space, the shape, textures of materials and improve their aesthetic features (nikki, 2019). It also plays an important role in ensuring the comfortability of occupants. When it comes to artificial lighting in architectural design, they are commonly planned at the later stages when the design is completed (Hammer, 1995). There is no problem implementing artificial lighting ideas this late. However, it also means that the design is far from its ideal. There are three aspects of artificial lighting in architectural design to look out for when used in the beginning stages. They are aesthetic, function and efficiency.

Aesthetics aspect

It focuses on the emotional effect it has on occupants. Like what do they want the occupants to feel when they stay in the building. It is also used in retails stores, like using lighting to highlight a product.

Function aspect

For occupant's needs such as being able to see clearly. Using lighting in pathways to guide users in the dark.

Efficiency aspect

Ensuring that necessary lighting is sufficient so that it is energy efficient (nikki, 2019). For example, installing more windows instead of light bulbs in a house or installing LED, light-emitting diodes instead of fluorescent lights as LED uses less energy.

2.4 BASIC FUNCTION OF LIGHTING CONTROL

Lighting controls are devices and systems that provide input or output (Haq et al., 2014). The control system gets data, determines what to do with it, and then changes lighting output as needed. To ignite a collection of lights, power goes down the circuit. This lighting system illuminates the area.

Switching

Switching is a simple output. On the wire connecting the power supply and the load, we observe a switch, (Maniktala, 2012). The circuit completes when the switch shuts (i.e., when the switch is flipped "ON"), enabling electricity to flow to the load. When it opens, the circuit is broken (the switch is flipped "OFF"), causing electricity to the load to be disrupted. As a result, the switch functions as a power controller.

Dimming

Dimming is another fundamental output. In addition to ON/OFF, a dimmer switch may change the current flowing through the load during the ON state, increasing or decreasing light output, . The output is constant dimming over the dimming range of the load.

Color and CCT Control

It is quite inexpensive to give consumers with the option to modify illumination colour and CCT with LED, (Huang et al., 2017) Tunable-white LED lights allow customers to modify the CCT of the light source by dimming arrays of warm and cool-white LEDs independently. Other colours may be added to broaden the colour range and improve colour rendering. Dim-to-warm (LED devices that dim to a very warm white, akin to incandescent dimming) and complete colour adjustment are two further options (separately dimmable red, green and blue LEDs plus amber or white and potentially other colors).

Manual Versus Automatic Input

Since depicted in this figure demonstrating the operation of a manual-ON wall box occupancy sensor, the input can be manual, automated, or a mix of both. The user initiates and implements the input using manual control. It's perfect for visual-driven apps. A signal from a sensor (occupancy or light sensor), computer, or another building system is used to give input for automated control. The input might be dependent on the time of day, the number of people in the room, the amount of light in the room, or another factor. For energy management applications, automated control is suitable, (Department of Energy (DOE), 2015)

Intelligence

With manual control, a human makes decisions about whether to adjust the lighting and by how much. With automatic control, a microprocessor or logic circuit performs this function. This microprocessor or logic circuit is called the lighting controller, which provides the control system's intelligence, (Lee & Chiu, 2020). The lighting controller evaluates input control signals based on its algorithm and decides whether to adjust lighting power, when to adjust it, and by how much.

The controller may be installed as a logic circuit within a standalone control device or as a separate component within a control system. If a separate component, it may reside in a central location (centralized intelligence) or reside in proximity to the load or embedded in luminaires (distributed intelligence). The more distributed the system's intelligence, the more flexible and responsive the lighting becomes.

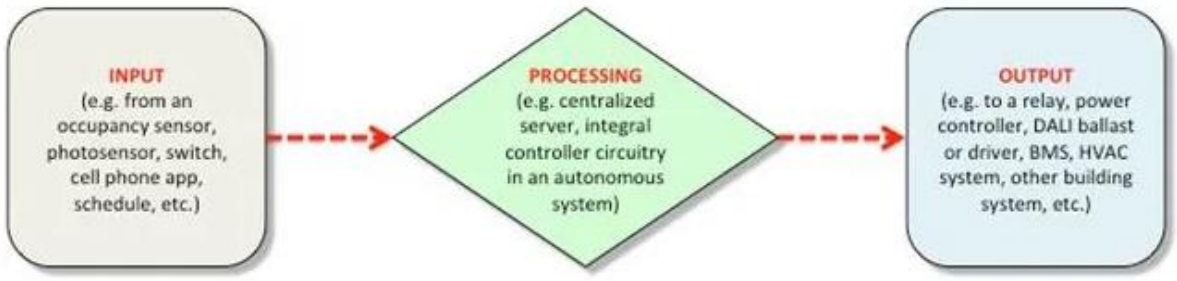


Figure 2.4: System Intelligent Process (Source: Google Image).

Switching Versus Dimming Output

Switching is straightforward, but it has limitations in terms of flexibility, and it may be inconvenient in shared places, (Yunus & Yang, 2011). As a result, it's especially useful for energy-management applications

like automatic shutdown or decrease in deserted places, as well as human control in locations where users have a common expectation about when the lights will be turned on.

Dimming alters the intensity of light with seamless transitions between levels, providing a great amount of versatility to meet user visual requirements. Dimmable drivers are standard or optional on the majority of LED luminaires, lowering the cost of dimming, (Yunus & Yang, 2011). In inhabited rooms, dimming is especially well suited for visual requirements applications and performing energy management measures like as daylight-responsive or job tuning control.

Control Zoning

Control zoning is an important aspect of lighting control system design, as zoning is the mechanism through which lighting controls are assigned to lighting loads. A control zone is defined as one or more light sources controlled simultaneously by a single control output, (Company, 1997). Zones may be organized in accordance with energy codes, desired energy savings and flexibility, common lighting equipment (e.g., fluorescent vs. LED), space characteristics (e.g., furnishing and finishes), tasks, daylight availability and lighting schedules.

Smaller control zones (higher granularity of zones in a space or building) introduce greater flexibility and typically higher energy savings, (King & Perry, 2017) For this reason, a majority of energy codes regulate control zoning by imposing limits on area.

Traditionally, control zoning and future rezoning was limited by lighting circuit wiring. Advances in communications enable relatively economical zoning as granular as individual luminaires or ballasts/drivers, and zoning and rezoning using software instead of hardwiring.

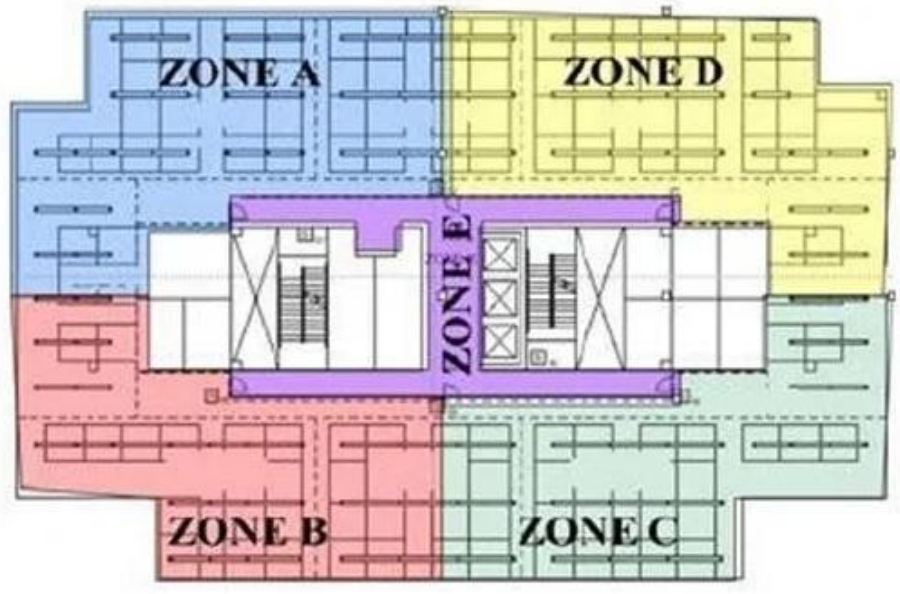


Figure 2.4: Image courtesy of Watt stopper (Source: Google Image).

Interoperability

For a control system to provide proper operation, the ballast/driver and light source must be compatible; the ballast/driver must be compatible with the control strategy and control devices; and the control devices must be able to communicate if needed. Largely, interoperability depends on control method or protocol. A protocol is a set of rules that define the behavior of components in a system. In a network, this includes communication, (Engineering, 2010). Examples include the Digital Addressable Lighting Interface (DALI) and ZigBee.

All controls must be designed to the same protocol to provide reliable interoperability, though different-protocol systems, including lighting and building automation, may integrate using a gateway, which may be a device or software function.

The protocol may be:

• open, or standardized and available to all manufacturers, which provides multivendor choice;
• closed, or manufacturer-specific, which provides a solution optimized by the manufacturer but ties the owner to that manufacturer for future service, changes or expansion; or
• a mix of the two, such as an open protocol adapted to become manufacturer-specific, or a manufacturer-specific protocol that is made available to other manufacturers through licensing.

Note that 0-10V dimming is a method, not a protocol. Controls and ballasts/drivers designed for 0-10V dimming therefore may be interoperable but produce somewhat different dimming performance, (Ecosystem, 2021). This is because they did the same way but otherwise do not perform in accordance with the same uniform specifications. To ensure consistent dimming, it is recommended to avoid mixing ballast/driver types from different manufacturers in the same dimming system.

Software

Various apps and software support implementation of lighting control systems. The most robust software is available for centralized intelligent networked lighting control systems, (Cheng et al., 2020)Residing on a server or in the Cloud, the software may provide many functions, such as:

- Discover control points (devices, etc.)
- Assign control points to zones
- Program sequences of operation for zones
- Calibrate sensors
- Monitor control points and issue service alerts/alarms
- Record and display energy use and other recorded data
- Back up data and event logs and create users/access levels

Wireless Systems

Wireless controls connect with one another by radio waves or another wireless method, obviating the need for control wires. This is especially appealing for retrofitting older buildings with sophisticated controls. An internal battery or energy harvested from ambient light, temperature differential, or mechanical energy created by activating a switch can power control input devices, (Covaci & Gontean, 2020). They provide control signals from a wireless transmitter to a wireless receiver in a lighting controller located at the luminaire, junction box, or panel.

Commissioning

Commissioning is a quality assurance procedure that guarantees that lighting control systems are installed and function according to manufacturer specifications and construction documentation. The Commissioning Process, as specified by ASHRAE Guideline 0 (and detailed in IES-DG-29), entails several processes, including Owner Project Requirements, Basis of Design, functional testing, systems manual, and operator training, (Dorgan et al., 2005). The most recent commercial building energy regulations demand

certain commissioning operations. Manufacturers provide devices that are either self-calibrating or easy to calibrate to aid commissioning.

Control Strategies

Combining numerous inputs and outputs, which can satisfy visual demands, energy management needs, or both. As a result, control mechanisms can be layered in the same region to optimize value, (Department of Energy (DOE), 2015). In many cases, both switching and dimming are desirable in the same structure. Manual control

- Occupancy sensing
- Time scheduling
- Daylight response
- Institutional task tuning
- Color tuning
- Data generation
- Demand response

CHAPTER 3

CASE STUDY OF LIGHTING SYSTEM MANAGEMENT AT BABA & NYONYA HALL, IXORA HOTEL PENANG.

3.1 INTRODUCTION

Figure 3.1: The view of Baba Nyonya Hall

Figure 3.1: The light system at Baba Nyonya Hall.

The function of this hall is to celebrate a momentous occasion amidst a unique and contemporary Baba & Nyonya inspired event at Ixora Hotel Penang. Immerse the guests in the exotic Peranakan culture and characteristics like no others, complemented by our attentive service, it can be assured that the event will be highly successful. The Baba & Nyonya Wedding Hall provides three different types of halls with 3.8m ceiling height, allowing flexibility of choice to meet individual needs and for those seeking more unconventional settings.

Hall Configurations:

- Baba Hall (108sqm)
- Nyonya Hall (225sqm)
- Baba & Nyonya Hall Combo (334sqm)

Baba & Nyonya Hall Features:

- State of the art audio visual and telecommunications technology
- Mobile stage can be built to requirements
- High speed Wi-Fi internet access
- Experienced event planners and prompt onsite music and staging support

The focus of this section is to determine the lighting point management system for Ixora Hotel's Baba Nyonya Hall. The data will be utilized to regulate lighting points at Baba Nyonya Hall as part of maintenance work. The Baba Nyonya Hall is one of the most appealing sites due to its brilliant lighting design. This location is ideal for me to learn more about the hall's lighting management system. Many different types of led lamps are utilized in this hall to make it more vibrant.

3.2 PLAN OF LIGHTING SYSTEM AT BABA NYONYA HALL.

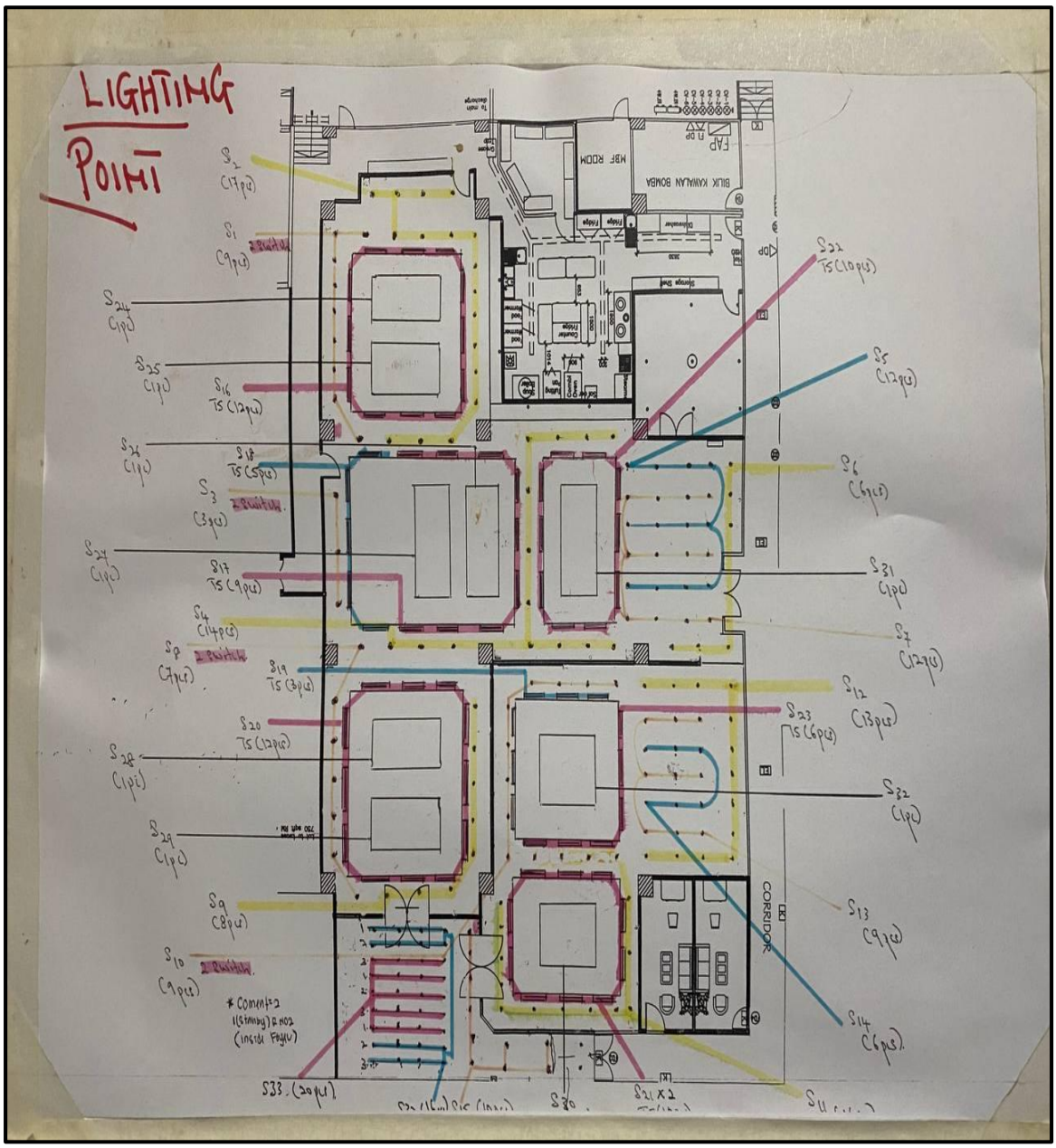


Figure 3.2: The plan of lighting system at Baba Nyonya Hall.

Figure 3.3: The lighting project at Baba Nyonya Hall for setup the RGB.

3.3 CASE STUDY ORGANIZATION

Apart from the importance of accessibility to case study firms and the availability of senior management support in any case study research (Harrison,2002), two key factors were examined in selecting case study organizations for this study. They are project-oriented organizations that have made efforts to enhance their project management practices and skills, or are attempting to do otherwise.

A total of four maintenance staff and two training staff organizations were selected in case study organizations for this report, among which conduct by En Rosli b. Ishak @ Mohamed (Engineering Manager), Mr. Raja Shaiful (Assistant Maintenance Executive Project), Mr. Khairul Amir (Project Maintenance), Mr. Syazrin (staff maintenance), Fitriyatul Amani and Intan Syafika (Training Students). Variations in these case study companies enabled a lighting management project, which improved the report's validity and supplied information for a future in-depth report. Due to a shortage of employees, the lighting project at Baba Nyonya Hall is being handled by the staff maintenance department. Because of their expertise and knowledge, they are able to properly manage this project.

3.4 TYPES OF LIGHT USED AT BABA NYONYA HALL

TYPE OF LIGHT	DESCRIPTION
 *(Source: Google Image)*	**LED STRIP LIGHT RGB** • RGB LED means red, blue and green LEDs. • RGB LED products combine these three colors to produce over 16 million hues of light. • Note that not all colors are possible. Some colors are "outside" the triangle formed by the RGB LEDs. • Pigment colors such as brown or pink are difficult, or impossible, to achieve.
 *(Source: Google Image)*	**MODERN LED MINI SPOTLIGHT** • High quality aluminum, durable, rustproof, high heat dissipation, beautiful, fashion. • In the case of the same lighting, COB bulbs save about 10 times more than ordinary bulbs. If a large number of LEDs are used as the illumination, the energy saved is considerable,
 *(Source: Google Image)*	**LED TRACK LIGHT** • Track lights are characterized by having a length of track that holds a number of LED light bulbs. • This is a highly versatile form of lighting that can be cut, curved and adjusted on the fly to meet your lighting needs on an ongoing basis. • Track lighting is that power is supplied through wires that run inside the track itself.

TYPE OF LIGHT	DESCRIPTION
 *(Source: Google Image)*	**LED T8 & T5 LIGHT TUBE** • T5 LED tube is thinner than T8 LED tube, as we known, one "T" equals the length of 1/8 inch, so ONE t8 is one inch, Simultaneously, T5 LED tube diameter is 5/8 inch. • T8 tube light is high brighter than t5 tube. • T5 with t8, t5 led tube light is more high efficiency than t8 tube light, the volume of t5 tube light is smaller and t5 tube light requires less power during the same time.
 *(Source: Google Image)*	**LED WALL DECORATION LIGHT** • LED wall lights can also provide some pretty decent lighting, including the USB-powered ones. • Lightweight and don't heat up like a regular bulb does after being on for long stretches.
 *(Source: Google Image)*	**LED CEILLING** • LED ceiling lights are available in a range of styles, from sleek round and square panel lights and intricate chandeliers to pendant lights that come in various shapes such as cones and cylinders.

CHAPTER 4

PROCESS & PROBLEMS OF BABA NYONYA LIGHTING SYSTEM

4.1 INTRODUCTION

In this chapter discuss on the Baba Nyonya lighting design process, to achieve the best overall outcome in a lighting installation, it is important to avoid the tendency of rushing straight into luminaire selection before determining more broadly what is required from the system.

4.2 BABA NYONYA LIGHTING DESIGN PROCESS

a) Identifying the requirement

This involves gaining a full understanding of what the lighting installation is intended to achieve. This includes the following:

- Illuminance
- Glare
- Mood of the space
- Relation to shape of space
- Things to be emphasized
- Thins to hide
- Direction of light
- Interaction of daylight.

b) Determine the method of lighting

At this stage, consideration is given to how the light to be delivered, e.g., will it be recessed, surface mounted, direct or indirect, or will up-lighting be used, and its primary characteristics, e.g. will it be prismatic, low brightness or mellow light. Consideration should be given at this stage to the use of the light to minimize the need for artificial light.

c) Select the lighting equipment

Once the method of lighting has been selected, the most appropriate light source can then be chosen followed by the luminaire.

The following attributes when choosing the light sources:

- Light output (lumens)
- Total input wattage
- Efficacy (lumens per watt)
- Lifetime
- Physical size
- Surface brightness

A number of factors also affect luminaire choice:

- Characteristic of the light source and control gear
- Luminaire efficiency (% lamp light output transmitted out of the fixture)
- Light distribution
- Glare control
- Finish and apparency

d) Calculate the lighting parameter

Photometric data for light sources and luminaires is commercially available to contribute to these calculations.

- Manual calculation method

  There are a wide range of manual computation methods for the calculation of difference lighting aspect. These include complex methods for calculating the illuminance from a wide variety of shapes of luminous objects. The majority of these have now been superseded by computer programs electrical design, MV and LV network and photometric calculations, voltage drop and short circuit calculations etc.

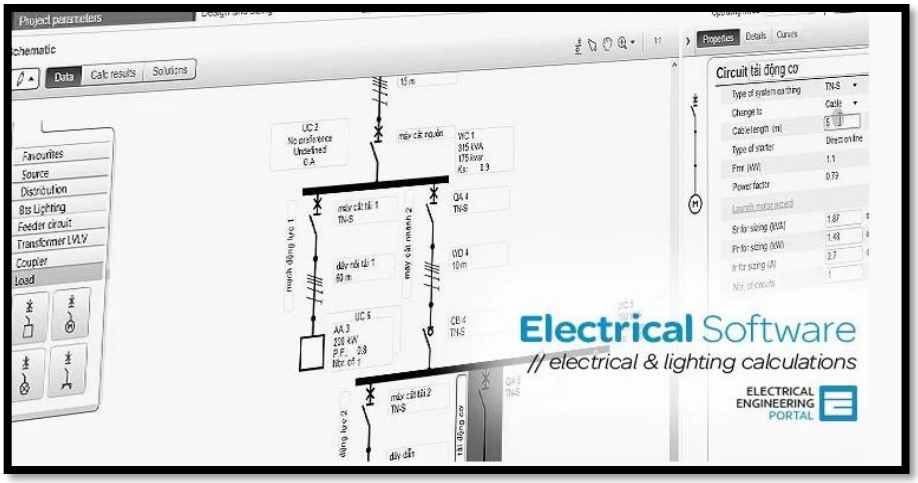


Figure 4.2: The electric software (Source: Google Image).

The lumen method was the mainstay for interior lighting and has remained in use as a quick and relatively accurate method of calculating interior element.

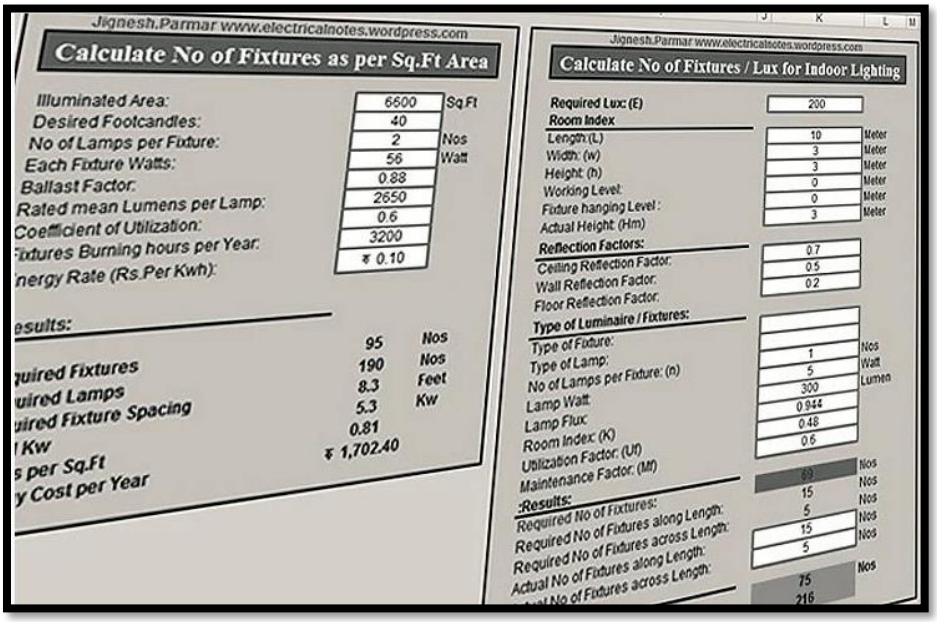


Figure 4.2: Spreadsheet of calculation of fixture number and illuminance level (Source: Google Image).

e) Determine the control system

The effectiveness and efficiency of any lighting installation is affected as much by the control system as by the light sources and fixtures chosen.

Give consideration to:

- Providing multiple switches to control the number of lights that come on at any one time. Using one switch to turn on all the lights in a large room is very inefficient.
- Placing switches at the exits from rooms and using two ways switching to encourage lights o be turned off when leaving the room.
- Using smart light switches and fittings which use movement sensors to turns light on and off automatically.
- Using timers, daylight controls and motion sensors to switch outdoor security lights on and off automatically, controls are particularly useful for common areas, such as Baba Nyonya Hall, corridor and stairwells, in muti unit housing.
- Using solar powered lighting for garden and security lights.

4.3 THE PROBLEM OF LIGHTING SYSTEM IN BABA NYONYA HALL

Lighting system problems on today's vehicles can range from replacing a bulb to tracking down an intermittent wiring problem. With lightbulbs in more and more places powered by extensive wiring networks, locating a bad bulb or a loose connection has become more complicated and more expensive than ever. The answer can be as simple as replacing worn out light fixture wiring or it may be more complex than that.

a) Flickering lights and frequent burning out

Flickering lights occur due to loosen connections or loose parts in the lighting fixtures as well as worn out contacts inside the fixture. Loose connections will affect a few lights on the circuit, while loose connections at the main wire will affect all the lights in the building. Poor quality lights or bulbs will flicker and provide poor and inconsistent lighting. Lights may flicker because of heavy loads, such as pumps that are unstable or overloading the circuits. A high rate of bulbs going faulty or burning up

could be due to loosen connections, worn out contacts, poor quality bulbs or faulty lighting fixtures.

Figure 4.1: Repairing the burning out of RGB led lamp at Baba Nyonya Hall.

b) Over lamping

This is a situation where the bulb in a lighting fixture has a high wattage that is beyond the fixture's rating. This may lead to overheating of the lighting fixture as well as putting a strain on the wiring, especially if in old buildings where the cables are likely to be smaller. Ensure you use the rated or lower rated bulb or switch or even energy saving LED or CFL bulbs, which do not produce a lot of heat.

c) Miscellaneous electrical problems

Confirm that you are not overloading the circuit. If one particular piece of equipment keeps on tripping the breaker, consider moving it to a less loaded circuit or add a separate, properly rated circuit for the heavy load. The circuit breaker may trip when one or more heavy loads are powered on. For example, it may trip when a heater, a microwave or both are turned on at the same time. This is easy to determine and resolve: simply power these heavier loads at different times. However, you may consider installing a separate high-powered circuit with larger conductors and a bigger circuit breaker.

d) Electrical Shocks from equipment

Electric shocks occur due to faulty wiring or equipment, missing or ineffective grounding, degraded insulation, or short circuits. Other causes include wet conditions. Exposed live surfaces or wet surfaces will cause electric shocks to anyone who touches them.

Figure 4.2: The spare part for led lamp was missing at Baba Nyonya Hall.

CHAPTER 5

CONCLUSION

5.1 CONCLUSION

The ambience of a hotel is greatly influenced by its lighting. As a result, hoteliers must establish the ideal environment in order to truly engage consumers. A consumer who feels at ease in their surroundings is more likely to have a great experience and, as a result, plan to return. Lighting plays an important role in setting the atmosphere and evoking the desired mood and feeling in support of the hotel's brand.

The intensity of ambient illumination in Baba Nyonya Hall varies at random across hotels of various star ratings, categories, affiliations, and ages. Despite the fact that hotels with a large number of rooms have substantially brighter lighting levels at their external entrances and interior lounges, there is insufficient data to support the claim that hotel lighting has no link with hotel size.

It can be concluded that, the value of lamp and luminaries for the best lighting design was estimated depends on the hall size dimensions and illuminance level. If there is more lumen that available in the lamp it will provide more brightness in the Baba Nyonya Hall. Besides that, I can learn every method of types of lamps, some basic of services in electric maintenance, and management schedule lighting maintenance.

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APPENDIX

ELECTRICAL WORK SCHEDULE

No.	Description	Frequency						
		D	W	M	3M	6M	Y	2Y
1.	**Electrical System** 17.1 Check component in electrical system					/		
	a) Switch room including riser room							
	b) Fuse switches					/		
	c) Distribution board					/		
	d) Luminaries							
	e) Switches and switch sockets outlets					/		
	f) Motor, protection equipment and water pump					/		
	g) Outdoor lighting – compound and street lighting, and building floodlighting					/		
2.	**Generator Set System (Stan-by Mode) a**) Timely removing of worn-out parts or upgrading the components	/						
	b) Check for fluids levels	/						
	c) Inspect for battery and cleaning of connections	/						
	d) Load bank testing	/						
	e) Verifying control panel reading and indicators	/						
	f) Changing fuel and air filters	/						

3.	**Substation System** 19.1Check for the substation equipment. a) Circuit breakers b) Power transformers and reactors c) Instrument transformers -CT & CVT d) Disconnectors/earthing switches e) Surge arresters f) Capacitor banks g) Earth grid and earth pits h) Wave traps and PLCC i) Battery and battery charges j) Relays and meters k) ACDB, DCDB AND DG sets l) Busbar/clamps/droppers/BPI	 / / / / / / / / / / / /						

Maintenance Work Programmed on Mechanical Work