



Hong Kong
Chapter



Malaysia Study Tour 2019 Report

19 - 25 August 2019 (Monday - Sunday)

 <http://ibse.hk/studytour/>

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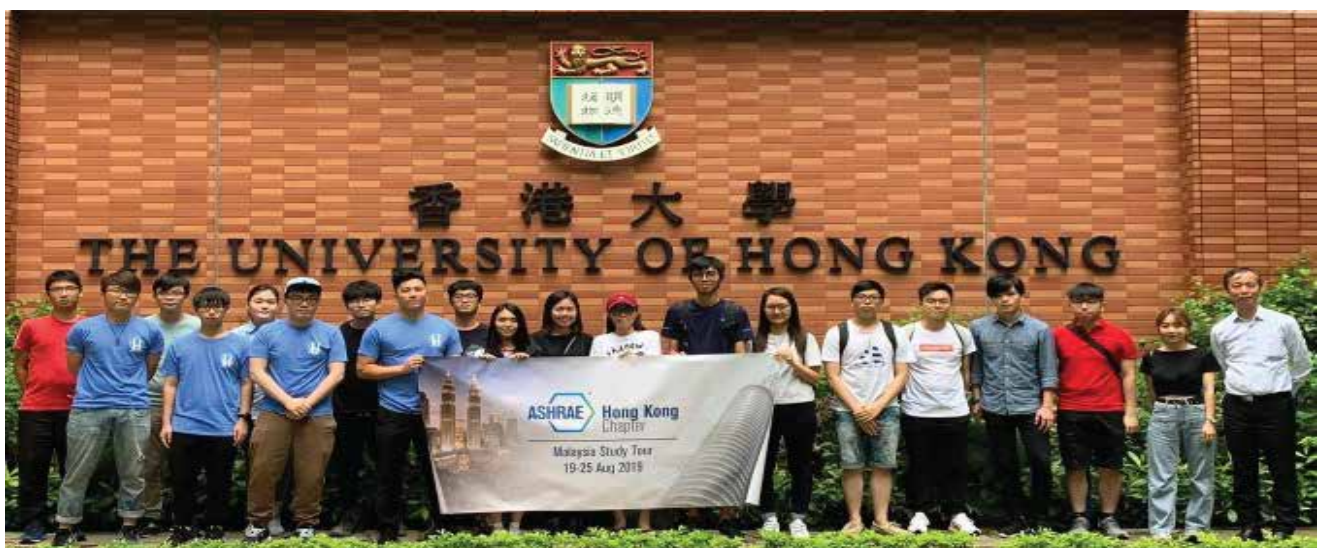
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Forewords

It is the 13th student technical study tour that the ASHRAE Hong Kong Chapter organized for supporting the university students in Hong Kong. In fact, the first study tour was started and held in 2006 to Kuala Lumpur, Malaysia. Similar study tours to Malaysia have been held in Year 2006 and 2012, respectively.

The Malaysia Study Tour 2019 will provide a good opportunity for the Hong Kong students to explore and experience the central region of Malaysia (including Kuala Lumpur and Putrajaya), by conducting academic and technical visits to local universities, green building projects, government agents, manufacturers and factories. During the study tour, the students will also attend the ASHRAE Region XIII Chapters Regional Conference hosted by the ASHRAE Malaysia Chapter and interact with the student representatives and delegates from Indonesia, Japan, Macau, Malaysia, Philippines, Singapore, South Korea, Taiwan, Thailand and USA. It can allow the students to exchange ideas with peer groups and professionals through the ASHRAE community. The experience will expand their vision in regional and international affairs.

May I take this opportunity to express sincere thanks to the ASHRAE Hong Kong and Malaysia Chapters, all the sponsors and related organizations and people for their kind support. I hope that our students will enjoy the trip and extend the experience and findings to benefit themselves, other students and our society as a whole.

I wish all the study tour students and CRC participants will have a very fruitful and enjoyable journey in Kuala Lumpur. Semua yang terbaik (All the best)!



Dr. Sam C. M. Hui
Study Tour Advisor
ASHRAE Hong Kong Chapter

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ASHRAE Hong Kong Chapter:

Mr. NG Chun Kei Jacky (Chapter President 2019-20)

Mr. WONG Shu Hung (Chapter President 2018-19)

Ms. LAI Sheung Yu Moka (Student Activities Chair 2019-20)

Mr. YIP Wallace (Student Activities Chair 2018-19)

Mr. CHOW Chi Fung Taylor (RP Chair 2019-20)

ASHRAE Malaysia Chapter:

Mr. NG Wen Bin (Chapter President 2019-20 & UniKL MFI)

Mr. KING Yeong Jin (Universiti Tunku Abdul Rahman)

Mr. CHEA Swei Keong (CRC2019 General Chair)

Mr. Jeffrey LIM See Boon (CRC2019 Student Activities & YEA)

Mr. Kozen LAW Kok Zhen (CRC2019 Student Activities & YEA)

Mr. Den Low (CRC2019 Hospitality)

Company sponsors:

Gold Sponsor - ATAL Engineering Group

Gold Sponsor - Ever Cool Refrigerating and Air Conditioning Co. Ltd.

Gold Sponsor - MESAN Cooling Towers Ltd.

Suruhanjaya Tenaga Putrajaya (Putrajaya Energy Commission)

Malaysian Green Technology Corporation (Greentech Malaysia)

Universiti Kuala Lumpur Malaysia France Institute (Uni KL-MFI)

Universiti Tunku Abdul Rahman (UTAR)

Green Building Index (GBI) Sdn Bhd

Pertubuhan Akiteknik Malaysia (PAM)

VTC Student Development Foundation (SDF)

THEi Faculty of Science and Technology

Executive Summary

The Malaysia Study Tour 2019 from 19th to 25th of August 2019 at Kuala Lumpur was jointly organized by ASHRAE Hong Kong Chapter and ASHRAE Student Branches in Hong Kong. The seven days tour was financially supported by ASHRAE Hong Kong Chapter, Technological and Higher Education Institute of Hong Kong (THEi)'s Faculty of Science and Technology and the Vocational Training Council (VTC)'s Student Development Foundation.

The objective of this study tour is to provide ASHRAE student members from Hong Kong the opportunity to observe and study green buildings and engineering technologies in Malaysia. The technical visits aim to enable the students to develop knowledge and skills in advanced energy technology, building environmental design and creative thinking. The rundown of the Malaysia Study Tour 2019 is also integrated with the Region XIII 22nd Chapters Regional Conference (CRC) and local academic exchanges at Malaysia Universities. These interactions hopes to promote international cooperation, cultural exchanges and mutual understanding in Asia countries. Students are also encouraged to network and exchange ideas under the ASHRAE family.

Green building technical visits carried out during the Malaysia Study Tour includes Suruhanjaya Tenaga Putrajaya & ST Diamond Building and GBI & Pertubuhan Aitek Malaysia (PAM), where architectural designs and implementation of sustainable designs were explored. The Malaysian Chinese museum introduced the Malaysian-Chinese culture to the students and provided them a better understanding of the culture and history of Malaysia. Academic exchanges and visits at UniKL MFI and UTAR Sungai Long Campus gave students the opportunities to exchange academic ideas and established unexpected friendships.

The Region XIII 22nd Chapters Regional Conference was the highlight of the study tour as students had the opportunity to experience three days of back to back activities hosted by the Malaysia ASHRAE chapter. The CRC began with a cross region RP bowling competition at 1U shopping mall where four Hong Kong student teams were personally sponsored by Dr. Sam Hui competed with students from all across region XIII. Students also participated in technical seminars, student forums and the traditional CRC banquet dinner on the following day, which strengthened the bonds and friendships established during this tour. The tour was concluded by a full day technical tours where students visited different factories and sites including Daikin, Intrix, Truwater, AAF, JAF and Yilida.

1 INTRODUCTION

1.1 BACKGROUND & OBJECTIVES

BACKGROUND

In August 2019, the ASHRAE Regional XIII 22nd Chapters Regional Conference (CRC) was held in Sunway Resort Hotel & Spa, Malaysia. This study tour is designed to allow students in Hong Kong to attend the conference and also to carry out technical visits and academic exchanges. Successful study tours to other countries were organized in 2006-2018.

OBJECTIVES

- To study the green building and engineering technologies in Malaysia.
- To enable the students to develop knowledge and skills in advanced energy technology, building environmental design and creative thinking.
- To promote international cooperation, cultural exchange and mutual understanding in Asian countries

1.2 ASHRAE HK CHAPTER

ABOUT US

The ASHRAE Hong Kong Chapter was founded in 1984. There are fourteen regions and one region-at-large in ASHRAE over the world. The Hong Kong Chapter is within the Region XIII which is the first Far East region out of the States. ASHRAE Hong Kong Chapter was initiated by several ASHRAE members among the leaders of the HVAC&R industry in Hong Kong, who had the vision, enthusiasm and great minds of serving. Nurtured by the effort of the chapter staff who all served as volunteers and with the support from the members and from the society. Throughout these years, the Hong Kong Chapter has now grown to become one of the largest Chapters of ASHRAE.



OUR ACTIVITIES

To enhance student's interests in HVAC&R technologies, we organize various functions and activities such as:

- Technical seminars, Talks and Visit
- Training Courses and Workshops
- Gathering Meetings
- China-Hong Kong Symposia
- Joint-Institution Study Tour
- Professional Course

The Chapter has maintained harmonious relationships with other professional institutions including the Hong Kong Institution of Engineers (Building Services Division) and the Chartered Institution of Building Services Engineers (Hong Kong Branch).

1.3 HISTORY OF ASHRAE STUDY TOURS

Japan Study Tour

20 Aug - 26 Aug 2018 (Mon - Sun)

Phillippines Study Tour

17 Aug - 23 Aug 2015 (Mon - Sun)

Indonesia Study Tour

26 Aug - 1 Sep 2013 (Mon - Sun)

Korea Study Tour

22 Aug - 28 Aug 2011 (Mon - Sun)

Thailand Study Tour

20 Aug - 26 Aug 2009 (Thu - Wed)

Taiwan Study Tour

2 Aug - 8 Aug 2007 (Thu - Wed)

Malaysia Study Tour

19 Aug - 25 Aug 2019 (Mon - Sun)

Singapore Study Tour

21 Aug - 27 Aug 2017 (Mon - Sun)

Taiwan Study Tour

10 Aug - 17 Aug 2014 (Sun - Sun)

Malaysia Study Tour

9 Aug - 15 Aug 2012 (Thu - Wed)

Singapore Study Tour

23 Aug - 29 Aug 2010 (Mon - Sun)

Phillippines Study Tour

25 Aug - 31 Aug 2008 (Mon - Sun)

Malaysia Study Tour

24 Aug - 30 Aug 2006 (Thu - Wed)



2. STUDY TOUR ACTIVITIES

2.1 STUDY TOUR PARTICIPANTS



LAM Cheuk Fung
THEi



Dr. HUI Chun Man



IP Ka Wun
THEi



LING Jing Tung
THEi



WONG Wang Sing
HKUST



CHAN Sui Hing
THEi



LAU Yat Ming
HKUST



LOK Wing Han
THEi



LAM Hin Shun Thomas
THEi



CHAN Ka Chun
THEi



CHENG Ka Wai
THEi



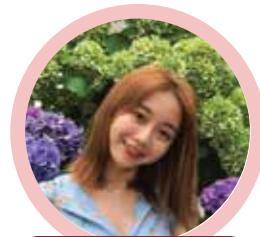
FENG Zhuoxiu
PolyU



HUNG Wing In
PolyU



CHUNG Kin Chiu
THEi



TSANG Yee Ting
THEi



Gulzhan ALDAN
PolyU



PANG Wing Tung
THEi



LAM Cheuk Yung
THEi



WONG Wai Chun
HKU



NG Hong Man
PolyU



CHAN Si Tung
THEi



LAU Ka Kit
THEi

2.2 TOUR ITINERARY

19 Aug 2019 (Mon)

HKG to KUL MH79 08:45-12:45 (4 hours)

20 Aug 2019 (Tue)

Visit Beryl's Beryl's Chocolate Museum

Visit Malaysian Chinese Museum

Visit Suruhanjaya Tenaga Putrajaya & ST Diamond Building

21 Aug 2019 (Wed)

Visit UniKL MFI (academic exchanges)

Visit UTAR Sungai Long Campus (academic exchanges)

22 Aug 2019 (Thu)

Visit GBI & Pertubuhan Akitek Malaysia (PAM)

ASHRAE Research Promotion (RP) Bowling

23 Aug 2019 (Fri)

CRC technical seminar

CRC Student forum

CRC banquet dinner

24 Aug 2019 (Sat)

CRC technical tour

25 Aug 2019 (Sun)

KUL to HKG MH78 19:50-23:50 (4 hours)

3.1 Green Building Project

1. Diamand Building

Suruhanjaya Tenaga Putrajaya
(Putrajaya Energy Commission)



The ST Diamond Building is located at Precinct 2, Putrajaya which is the headquarters of Energy Commission, at the same time it is a new green landmark building of the city. It contains 14,230 square meters of gross floor area and 11,473 square meters of nett floor area. (Mgbc.org.my, n.d.)

As a green building, 3,600 square meters of green landscape area can be found as well. (Mgbc.org.my, n.d.) Under the Green Building Index, the assessment of the green building in Malaysia, it has complied with the Platinum rating requirement. At the same time, it earned the same rating under the Green Mark program of Singapore. (Inhabitat.com, 2012)

The government established the energy commission under the energy commission act 2001, it strives to be a highly effective energy regulator as well as the authority on energy matters. Customer's and energy provider's needs are both considered by the energy commission to take the balance between them. It aims to protect the public interest, maintain the safety and reliability of power supply without unreasonable prices as well as stimulate the economic development and competitive markets under environmental sustainability. (St.gov.my, n.d.)

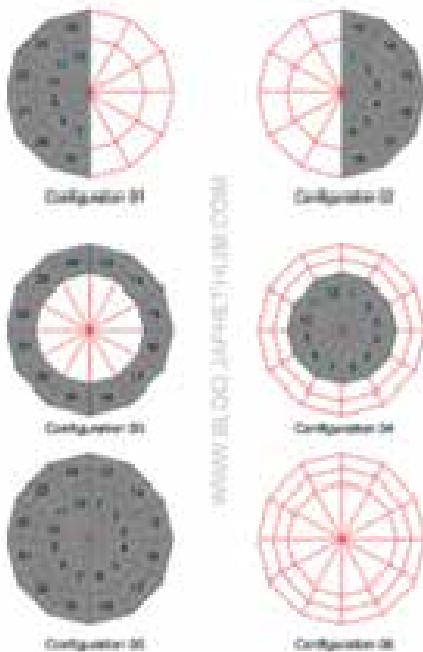
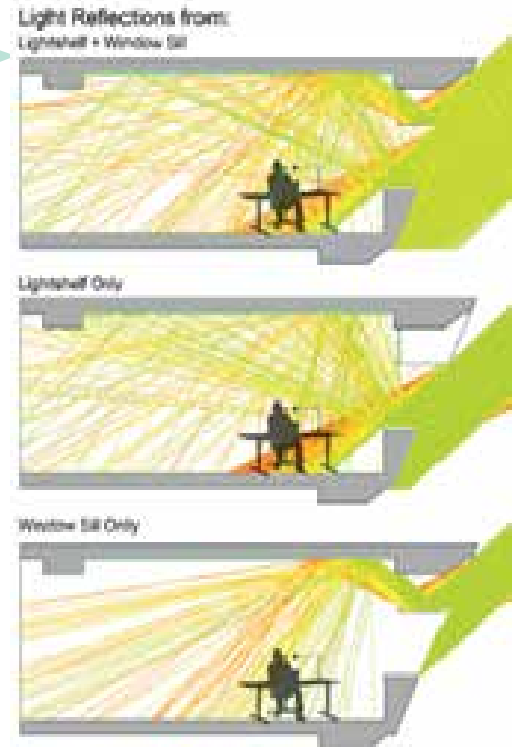
There are three main roles for an energy commission, they are economic regulation, technical regulation and safety regulation respectively. For economic regulation, they are responsible to avoid the misuse of monopoly or market power in the electricity and piped gas industries, also promote competition to provide a fair and efficient market. For technical regulation, they have to make sure the electricity and piped gas supply are secure, reliable, high efficiency and good quality. To prevent any dangerous incident from generating, transmission, distributing and supplying electricity and piped gas is the main purpose of safety regulation. (St.gov.my, n.d.)

Green application of Diamond Building

As a green building, ST Diamond Building contains plenty of green applications for achieving the aim of sustainable development, including “Daylight strategy”, “Renewable energy”, “Floor Slab Radiant Cooling”, “Water Efficiency” and “Green Transportation”.

Daylight strategy

The architectural design of this building can help to redirect daylight into the building. It can be found that this building is designed with many glass windows, it would allow more daylight into the building. Also, the light shelf and window sills are installed which can reflect the sunlight to the ceiling. The walls and ceiling in the building are painted with white colour which would help for the daylight reflection in the rooms. Up to 5 meters from the façade and 2 meters of corridor areas in the building can also be illuminated with the daylight distribution (JAPHETHLIM.COM, 2013). Thus, the daylight distribution inside the building would be more balanced, and more spaces can be illuminated.

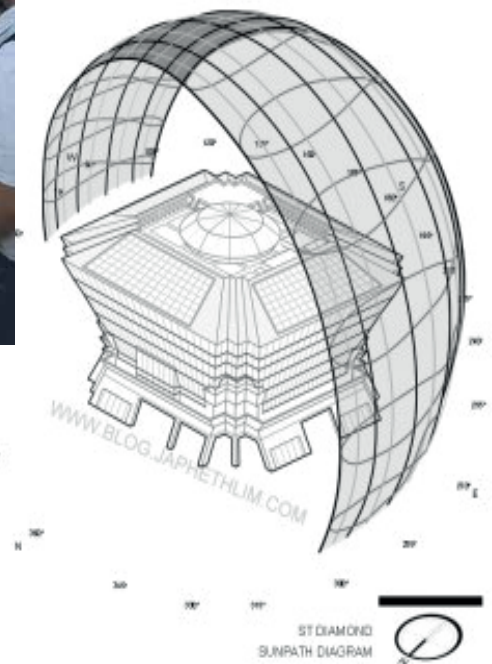


Blind Configuration based on Lower & Upper

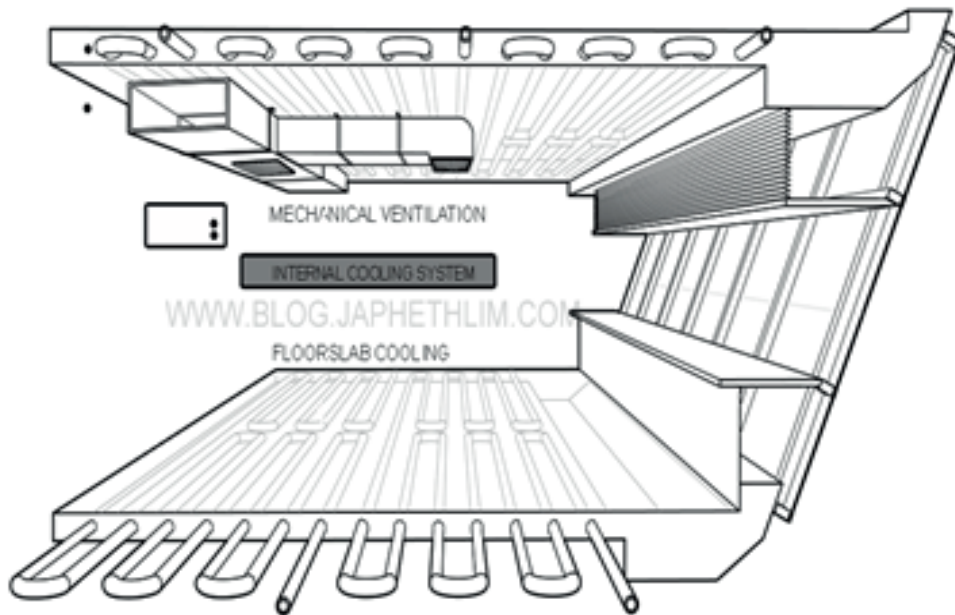
Moreover, the glass dome of the building is designed with “diamond” shape which would allow the daylight into the atrium of the building. It also contains a dynamic shading system that is about 6 different configurations of automated blinds for controlling the natural lighting level into the building with every 15 minutes and different periods (Asia Green Buildings, 2013). Therefore, the central atrium and internal spaces in the building can also be illuminated with an appropriate level of daylight. These daylight strategies can reduce the reliance on artificial lighting during the day time effectively, which can decrease the energy consumption for lighting.

PV panels

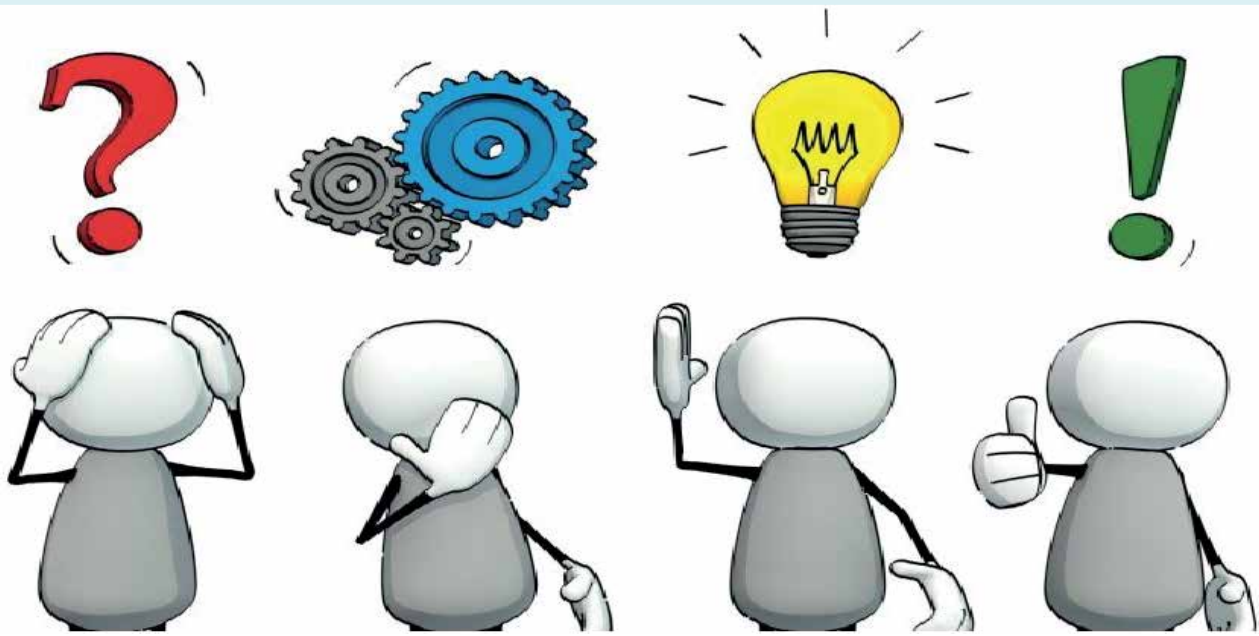
For renewable energy, a large number of photovoltaic panels are installed on the roof of the building for receiving solar energy. The weather of Malaysia always is a sunny day as it is located on the equator. So, it is possible for the building to obtain a large amount of solar energy for electricity generation. Moreover, as the architectural design of this building is “diamond” shape, more space on the roof can be used for installing many photovoltaic panels. This building is applying the thin film telluride module type photovoltaic panels with a capacity of 71.4 kWp which can produce 102,000 kWh of electricity per year (Suruhanjaya Tenaga, 2019). Thus, it can reduce the carbon footprint of the building by using renewable solar energy. Furthermore, this type of photovoltaic panel contains higher efficiency. By comparing with the conventional type, thin-film telluride module type photovoltaic panels can receive more diffuse light. Also, the energy efficiency of thin-film telluride module type is 1400 kWh/kWp under a long period of hot temperature condition, but conventional type only obtains 1150 kWh/kWp (MESYM.com). Thus, more solar energy can be used for generating electricity that can fulfil the aim of green building.



Floor slab cooling system



Floor slab cooling system is one of the unique technologies applied in ST Diamond Building. During the construction stage, the polyethylene-reinforced thermal pipes have been installed and embedded in the concrete slab. The function of the concrete slab is like a heat storage container, which cools the temperature to 22 degrees every night from 10 pm to 6 am. Then absorb the heat of the surrounding during the daytime, such as the heat emitted by the human body and computers. And cool down again at night. By using this system, the radiant cooling from the floor slab is achieved by cooling the reinforced concrete floor slabs with chilled water by 19 degree Celsius. This is complemented with the conventional cold air supply system. Also, this reduces cooling transport energy by 64% because it is more efficient to transport cooling with water than with air. Moreover, the AHU system used in ST Diamond Building can be down sized about 30% because much of the cooling being shifted to the slabs (JAPHETHLIM.COM, 2013).



Water Efficiency

Water-saving strategies are applied to enhance water efficiency in ST Diamond Building, such as rainwater harvesting, using efficient water fittings and greywater recycling for the wetland. The rainwater is collected from the 700m² catchment area and stored in four 10,000 litres rooftop tanks. Rainwater harvesting is used for toilet flushing and plant irrigation, combined with efficient water fittings like dual flush toilets, waterless urinals and water taps equipped with aerators. This strategy can reduce the annual potable water usage by more than 65% (JAPHETHLIM.COM, 2013). Also, graywater from washbasins and floor traps is piped separately through a sand filter to a collection tank from where it is reused for irrigation of a mini wetland instead of going to the sewerage. In order to further optimise the water efficiency of the building, greywater collected is also recycled to irrigate the wetland on the ground floor.



Green Transportation



ST Diamond Building is designed to reduce the significant amount of carbon footprint of transportation. There are two Electric Vehicles (EV) charging stations installed in the basement level. Also, 10% of parking areas are designed for priority green vehicle parking areas. Reserved parking lots are provided for green vehicles, thereby encouraging the use of such vehicles and carpools. The bicycle racks and showers are also provided in the building to encourage employees living nearby to ride a bicycle instead of driving to work.

Comparison to Hong Kong green building(Zero Carbon Building)



Diamond Building is one of the high standard green buildings in Malaysia, it is good to compare it with Hong Kong green building like Zero Carbon Building to understand the different strategies on green application.

Rainwater Harvesting system

For the rainwater harvesting system, a large amount of rainwater is occurred due to the weather of Malaysia results in rainwater as a water source for the Diamond Building. Diamond Building collects all the rainwater into the rainwater tank for the use of toilet-flushing and the treatment of the green roof. Total of building's water usage is cut down about 70% to 80% with the rainwater harvesting system and water-saving fixtures (Eco-Business, 2012).



Compared with Zero Carbon Building, the rainwater is enough to the treatment of reed beds only and the blackwater from toilets is being processed and recycled for toilet-flushing (ZCB, 2018).

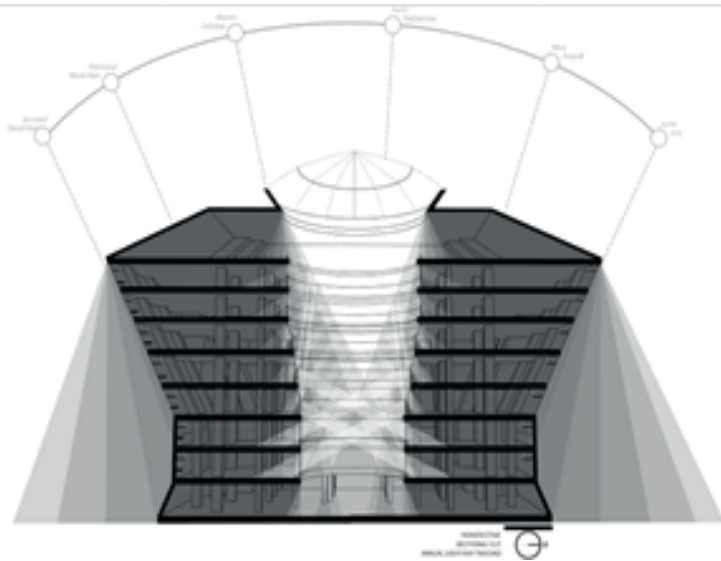
Due to the weathers of two location are different, Diamond Building can rely on raining since the climate of Malaysia is equatorial, rainfall is frequent throughout the year (Climate to travel, n.d.). On the other hand, Hong Kong's climate is sub-tropical, rainfall is frequent during the summer season, so the Zero Carbon Building can not rely on rainwater as a major water source to the building (Hong Kong Observatory, n.d.).



Storm Water Harvesting

A 180m⁵ rainwater storage tank is installed to store rainwater processed from constructed wetland and landscape area for irrigation

Natural lighting & sun shading devices



Light shelves on its southeast and northwest facades shade the periphery and distribute daylight furthest away from the windows

The Glass Dome which is on the top of the Diamond Building. The diagram below suggested that the shape of the Diamond Building can control the daylighting and allow natural light into the building. A central atrium has several functions which to cope with the outdoor lighting to maximize the daylighting. Also, the shape of the building and the Low-E window glass reduce heat gain infiltration. Not only the exterior window façade blocks direct daylight into the building to reduce heat gain from daylight, but also the Low-E glass filter the unnecessary light like infrared and ultraviolet light into the building to maintain the interior temperatures in a comfort level.

Compared with Zero Carbon Building, it focused on applying sun shading devices for reducing daylighting. A large glass wall on the northwest façade faced the unobstructed sky and sheltered from direct daylight. Also, the light shelves which are shown on the below provide sun shading and distributing daylight function into the building. Besides, the light pipes can reflect the sunlight from the domes on the roof into the building due to the highly reflective tubes, which is applied for the window-less areas.

The shape of both buildings are different, Diamond Building can make use of the shape for sun shading and natural lighting distribution. For the Zero Carbon Building, since it is surrounded by high rise buildings, some of the natural lightings is reflected by surrounding buildings which is not suitable to design like Diamond Building. Zero Carbon Building relies on the sun shading devices and lighting tubes to distribute the natural lighting into the building.

Radiant cooling systems



Chilled Beams

Chilled water is directed to the chilled beams. By the radiant cooling effect, similar experience of "coolness" in caves is created in the interior space

Radiant cooling pipes were installed in the floor before the concrete is poured. The image below showed that the radiant cooling pipes are installed in the floor level inside of concrete. The cooling pipes carry the chilled water which will operate at night, they will cool down the concrete floor as a thermal storage medium. On a working day, the concrete slab will release the stored cooling effect on the indoor environment passively through radiant cooling and thermal convection. This strategy of passive cooling will reduce the peak heat load of the building and it is one of the key components for building thermal comfort design.

Compared with Zero Carbon Building, it applied Chilled Beams to reduce the use of mechanical cooling. Chilled beams are installed on the roof level, with the radiant cooling effect, to cool down the interior temperature without a mechanical cooling system. The chilled beam systems are installed in this is an active type. Since the chilled beams without moving parts, the systems will quieter than VAV systems and maintenance cost will be lower (Buildings, 2018).

Since the Chilled Beams are installed on the ceiling level, it is easier to remove the heat than the floors which are radiant cooling pipes system. Floors contain furniture, carpets which will reduce the efficiency of the system.

2. PAM Centre Bangsar Pertubuhan Akitek Malaysia (Malaysian Institute of Architects)

Akitek Malaysia (PAM), originally established as the Institute of Architects Malaya (IAM) in 1920 has a history of nearly 100 years. In 1948, the name was changed to the Federation of Malaya Society of Architects (FMSA). Pertubuhan Akitek Malaysia – The Malaysian Institute of Architects, under the present constitution was registered with the Registrar of Societies Malaysia on 20 January 1967. Today it is the national professional institute representing architects in Malaysia.

The mission statement of the Institute is "To promote the advancement of architecture and the architectural profession for the betterment of society". The Institute provides its members with an effective framework: to do, to run and to get the business of architecture within the Code of Conduct and Scale of Fees.

The PAM Centre, the new headquarters of the Malaysian Institute of Architects (PAM). To house a Members' Service Centre, Administration office, Conference Centre and Training Centre for the future of architects in Malaysia, enable us to explore the forefront of building the industry that symbolizing the future. The PAM Centre has five key design features including timeless, sustainability, practicality, innovation and economic befitting PAM's aspiration as a centre for architecture advancement and development. "It also offers the best views of Bangsar," said Ezumi.

With a built-up of 3,782 square metres (including an auditorium, exhibition hall and rooftop with a soon-to-be-built skybar), the centre also promises to be one of the greenest buildings in town. Its exposed concrete walls are surrounded by black aluminium screens, a powerful structure like the boulder of this block. A close inspection reveals a diagonal "small garden" at all levels.



Lighting Design



The model building has implemented some energy-efficient features to minimize the energy consumption of the lighting, including lighting zoning and various choices of lighting devices installed. The highlight of the lighting architectural design of PAM is smartly utilizing the natural light. The transparent rooftop and clear glass on the facade allow the maximum amount of access to daylight. During the daytime, most of the corridors, staircases, open areas are only illuminated by sunlight rather than lamps. Even indoor offices and conference rooms also rely on natural light with supplementary of indoor lights. The electricity consumption of lighting at daytime is significantly reduced.

Moreover, the lighting zone is a designated geographic area that is under the requirements for the lighting power densities and specific control, equipment or performance. To adopt the monitoring and turning, various corresponding devices and utilities are required to achieve the optimization of lighting usage, such as lighting sensors, motion sensors, etc. Lighting sensors can detect the dimness of a certain area. Once the low light intensity is detected, the sensor will send out a signal to trigger the lighting. On another side, the motion sensor aims to trace the human activities of an indoor area. Radar detectors which are installed on the floor will be triggered if it receives a reflected signal from a moving object. Besides, the lighting facilities operate under a specified schedule including two systems in daytime and nighttime. At daytime, only lighting sensors are switched on to ensure sufficient brightness in the corridors during the office hours. At nighttime, only motion sensors are in functions since campaigns sometimes are held at night. The building provided minimum lighting in an open area, like corridors and the rooftop. If those areas are in use, the motion sensors able to respond to provide extra lighting. This kind of smart and automation system constructs a comfortable as well as environmentally friendly building to the occupants.

Air-Conditioning System



The air supply of the building is from the HVAC system and the natural ventilation. One of the characteristics of the PAM is involving a lot of open areas and porous features. The shading of the building allows air flows into the lobby and corridors which are interconnected between each floor. The layout of the lounge open area and staircase at each floor are well arranged, such that the wind could flow from one floor to another easily. Some fans are installed on the ceiling to facilitate the ventilation. Such kind of interior design can maximize the usage of natural ventilation to attain ideal thermal comfort level.

Meanwhile, the indoor areas are served by the high-COP VRF System that the refrigerants are only the cooling media to cool the chiller water. Besides, there is an inverter which connects to the coil that provides variable current to minimize the power consumption.



Water Usage

Water recycling and usage reduction are also the focus of a sustainable building. Rainwater harvesting and water-efficient fittings are installed in the building which has substantially reduced the water demand and water fee from the water suppliers. For the rainwater collecting system, all potable water and irrigation water are rely on rainwater storage. It helps to achieve the self-sustained water building. Also, the WELS 3-ticks rated water fittings also minimize water consumption and wastewater.



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3.2 Academic Visits and Exchanges

1. UniKL MFI



Listening the student presentation



Group Photo with teacher in UniKL MFI



Visiting the HVAC Labortory and listening the teacher description

UniKL MFI is a university that provides an interaction with foreign students to study. All academic engagement and documentation are in English. Bachelor(Hons) and diploma of Engineering Technology are set up for the students. In the air conditioning and industrial refrigeration programme, the aim is to advance Malaysia to be an industrialized nation in international level. For the HVAC equipment, UniKL provides centrifugal pump trainer unit, clean room class 7 systems, solar collector, heat conduction trainer unit, VRV multi indoor unit, etc.

In this academic exchanges, we have learnt and seen the basic components in chiller system and heat rejection system. For example, compressors, supply air duct, air handling unit(AHU), linear diffusers, return air duct and the switch panels are installed in the laboratory room for the student's academic study. We had an interaction and communication with the local and oversea student who studied in this university. Also, the lecturers courteously introduced the basic information of this university and provided some food as the lunch to us.

2. UTAR Sungai Long Campus



On the third day of the study tour, we visited the Sungai Long campus of Universiti Tunku Abdul Rahman (UTAR) university. It is a non-profit private Malaysian university which consists of 9 faculties and offers foundation, undergraduate and postgraduate programs, which was officially launched in 2002. Here, we met some undergraduate students from different backgrounds who study mechanical and chemical engineering, material science, and mechatronics. It was very exciting to meet students from different disciplines and to discuss with them the differences between our university systems and programs. The students organized a campus tour for us; they showed us the lecture as well as laboratory rooms where they have practical classes. Two of the laboratories we visited were mechatronics and noise laboratories which have a very diverse range of high-technological equipment. Even though the university is very young, the quality of the classroom and laboratory equipment impressed us a lot and showed us the university's dedication to achieving excellence in research.



Tutorials are the smaller classes where we can ask questions and have a discussion with the tutor or other students. Practical classes are commonly arranged for science, engineering, information technology programs that require hands-on learning through practical or laboratory work.

3. Malaysia Chinese Museum



During visit the Malaysian Chinese museum, it shows the 2000 years history of Malaysia. The purpose of the exhibition content is to promote the spirit of mutual support and support among the Chinese rulers and the various ethnic groups in the history of the founding of the country. At the same time, it demonstrates the sacrifices and contributions made by Malaysian Chinese to the country. Malaysia is an interesting country which combined different culture as there is an immigration because of the corruption and war famine of China, some of the Chinese have immigrated to improve life. Baba Nyonya is the descendant of the Chinese and Malaysia, it combined the cultural elements of two countries in food, language, costumes, and architecture. So, there are many exhibits are similar to Hong Kong Heritage Museum. We have learnt lot of special culture and history in this museum, it a memorable visiting in study tour.

Malaysian Chinese Museum 馬來西亞華人博物館

Address: Lot 15285, Lebuhraya Sungai Besi, Seri Kembangan, Selangor

Website: <https://www.star2.com/culture/2018/10/16/malaysian-chinese-museum/>

4. Beryl's Chocolate Museum



Beryl's Chocolate is a well-loved consumer brand throughout the country and beyond. The products have gained the recognition of discerning customers both locally and overseas. Beryl's Chocolates can now be found in over 15 countries around the world. We are excited to visit the chocolate factory and have a chance to know more about the procedure of making chocolate. The tutor have introduce the history of the museum, the difference type of chocolate. The Gallery features informative illustrations, vintage machines from the past days, variety of chocolate packaging from all around the world and also priceless antiques. After we finished the tour, there are some samples to taste the chocolate and bought the souvenir and gift. There are many type of chocolate like tiramisu, milk chocolate, Durian chocolate, sea salt chocolate. Everyone have bought lot of product here.

Beryl's Chocolate Museum

Address: 2, Jalan Raya 7/1, Kawasan Perindustrian Seri Kembangan, 43300 Seri Kembangan, Selangor Darul Ehsan, Malaysia.

Website: <https://www.berylschocolate.com.my/>



3.3 CRC Functions

1. RP Bowling Competition

Before the bowling contest, some of the participants go to the bowling alley which is near to our first hotel which is The Everly Hotel. Most of us are rookie, it is a good opportunity for us to practice the bowling skill and enhance our teamwork skill.



The RP bowling was held in the 1U shopping mall which contain a large bowling center for holding the competition. During the bowling contest, we have four teams to represent Hong Kong chapter, thanks to Dr. Hui who sponsored all teams to join the contest.



Sine some students from other chapter were also joined in this bowling contest, we were able to have interaction with them. We could exchange the experience and skills of bowling with each other. Besides, there is one team including the students of Hong Kong and Malaysia. It is one of the opportunity and example for us to share the thoughts and ideas to the students from Malaysia, we understand the cultures of Malaysia like they need to wear long pants as a form of respect to others.

Moreover, not only the students are joining the contest, there are committees from chapters to join the contest. We are lucky the team contests are separated into student team and chapter team since most of the committees are professionals, you can see it from the gesture and movement to swing the ball.

We are glad and surprised that all teams from Hong Kong chapter win all of the prizes including champion, running up and second runner up. Thanks to the contribution to all teams and it seems that we all got talent to bowling since most of us are new to it.



2. CRC Technical Seminar 1 (By Professor Chandra Sekhar)



The main theme of this sharing is about the Emerging HVAC Technologies for Energy Efficient Healthy Buildings in Hot and Humid Climates, held by Professor Chandra Sekhar. The reason why this topic is so impressive is because that it can also apply in Hong Kong, where the climate is also hot and humid at the most of the time. In this presentation, Professor Chandra Sekhar describe the logical sequence of source control followed by exposure control in the sustainable design of healthy buildings and the concept of “Decoupled Ventilation Systems” in the context of enhancing IAQ in an energy efficient manner. Also, he explained how these Decoupled Ventilation systems operate - Dedicated Outdoor Air System, Single Coil Twin Fan system, Heat Pipe Integrated Air Handling Unit, Personalised Ventilation system and DOAS-Ceiling Fan Hybrid System. Besides, he quantified the Thermal Comfort and IAQ enhancements as well as the energy saving potential of some of the systems.

According to Professor Chandra Sekhar, in recent times, clear associations are being established between ventilation rates, Indoor Air Quality (IAQ) and the productivity of workforce in various types of buildings, most significant of which is the commercial and office building sector. It is also an established fact that HVAC systems do consume a significant proportion of national energy budget in any country irrespective of whether the HVAC design is “Cooling Driven” or “Heating Driven”. Hence, the notion of Energy Efficient Healthy Buildings is gaining popularity worldwide in the context of sustainable design and it is even more challenging in hot and humid climates that have all-year air-conditioning demand in the form of energy intensive cooling and dehumidification. It is quite apparent that Climate Change effects are only going to make the HVAC designer’s job even more challenging in the future. Whilst source control is commonly advocated as the fundamental approach to eliminating or containing the contaminant levels inside the building, a more practical and often necessary approach is likely to be exposure control. Thus, ventilation plays an important role in providing a quality built environment. The concept of decoupling “ventilation air” from “supply air” is fast emerging as an ideal solution to combat thermal comfort IAQ issues in a sustainable manner. This talk will highlight some of the current and future technologies for air-conditioning and air-distribution that can collectively contribute to the design of energy efficient healthy buildings.

3. CRC Technical Seminar 2 (By Vincent Tse)



The main theme is discussing the HVAC System and Building Design Integration Challenges in Mega Tall Buildings. In the past, most of the super tall buildings, including the Hong Kong Bank of China Tower, Malaysia KLCC Petronas Towers and New York World Trade Centre, are below 400m tall. It is the iconic, visionary, shocking and landmark of the city. In future, plenty of mega tall building, such as the Saudi Arabia Kingdom Jeddah Tower, Bangkok Grand Roma Super Tower and Jakarta Signature Tower, are mostly higher than 600m. It mainly used as Grade AAA Office, 6 Star Hotel and Shopping mall. Also, the well-known architects may highlight on the shocking and astonishing building shape. Tourists may feel excited when appreciating on the observation deck.

On the other hands, there are specialised design consideration for super tall buildings. For instance, designers should pay attention on the vertical transportation system, fire and lift safety, and energy efficient HVAC Design. It aims to achieve high operational reliability, flexibility and maintainability. Moreover, engineers apply various sustainable features to utilize the renewable energy, maximize the water recycling and minimize the excessive heat gain. For example, the sloping roof for Solar PV Installation Purpose, Glass Entrance Canopy with Water Element and Tall Tree Lined with Streetscape for Cooling Effect may achieve the green building purpose. They aim to accomplish the LEED and WELL Platinum Grade Sustainable and smart Building Standard.

4. Student Forum

In this Malaysia study tour, one of the best memory is the student forum right before the banquet dinner. In this student forum, we had met a lot of friends from different chapters, countries and culture such as Philippines and Taiwan. In the forum, the host chapter, Malaysia chapter had held a series of activities for us to improve friendships. The first game is called the ice breaking game, whose aims are to let the students get familiar with each other and improve the team cohesion. The host asked each group of students to do some required actions together and let them know more about others through it. For example, the host asked each group to queue in a priority of age. Through this way, each group member would know more about others and become friends eventually.

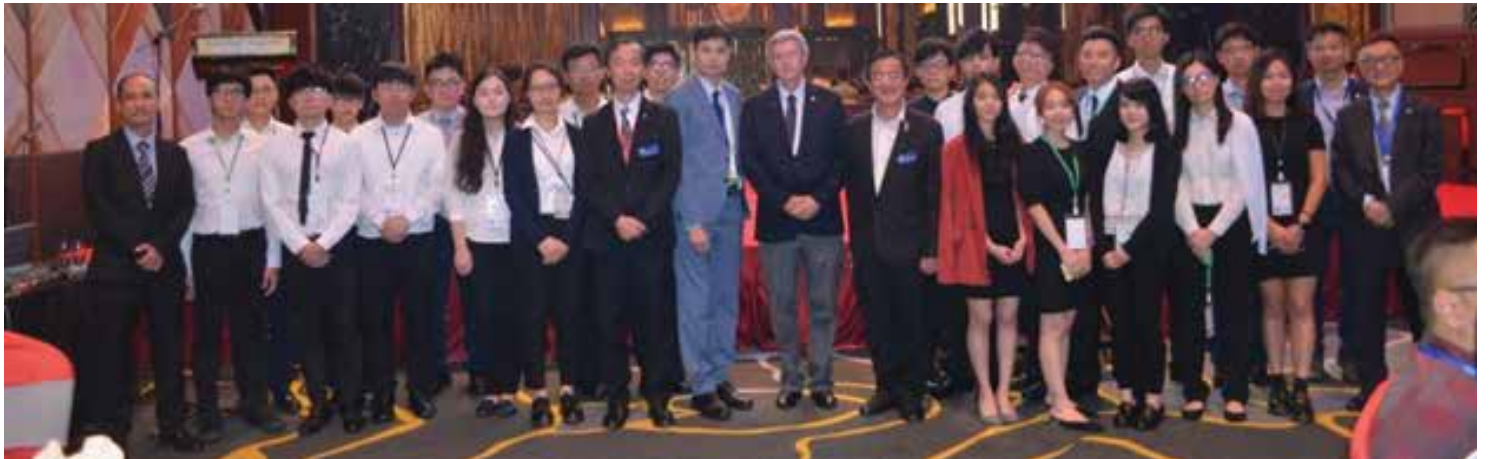


Afterwards, Malaysia Student Chapters have organised a challenging team-building competition. Student from different countries, including the Tai Wan, Philippines, Macau, Hong Kong and so on are required to wear the eyes blinkers and line up correspondingly. They need to set up a series of signals related to go straight ward, turn to the left, turn to the right and stop immediately. When games started, students need to follow the signals and proceed the actions. The front persons need to pick up the table tennis and drag it into the correct box, meanwhile, the back person need to deliver the signals accurately. There is plenty obstacles during the game. Fortunately, with the support of Malaysia Student Chapters, different groups may overcome the challenges and finish the stimulating tasks. We need to say thank you to the ASHRAE organisers, professors and students' helpers.

5. Banquet Dinner



The ASHRAE Region XIII CRC Banquet dinner was organized in Malaysia Sunway Resort Hotel & Spa on 23/8. It is joint by various ASHRAE Chapters, such as Taiwan, Thailand, Philippines, Singapore, Hong Kong and the main organiser – ASHRAE Malaysia Chapter. There are 347 people in total to attend the dinner.



There are total 21 students from ASHRAE Hong Kong Chapter, they come from different Universities like 1 student from The University of Hong Kong and studying Mechanical Engineering, 2 students from The Hong Kong University of Science and Technology also studying Mechanical Engineering, the rest are come from The Hong Kong Polytechnic University (4 students, including 1 international student) and Technological and Higher Education Institute of Hong Kong (14 students) and all studying Building Services Engineering.

In this CRC Banquet Dinner, there are various events including student performance and award presentation. It provides great opportunities for all participants exploring overseas culture and exchange with different people from different Asian countries.

In HK student performance, all 21 students sang 2 songs. The first song is Imagine – John Lennon. Sending message to everyone about we are all together with no barrier even we come from different places. The second song is 光輝歲月 from Beyond. Although it was simply a song singing, we sang with our heart for these meaningful songs. All participants enjoy our performance which can be seen by their movement.



Moreover, HK students have chance to talk to students from other countries. They know HK nowadays' situation very well and showing concern and support to us. Besides that, Malaysia students are willing to share with us about the local food and markets. Some students exchange the Facebook, and Instagram in order to keep in contact. Not just that, students from various countries including HK students grouped together to have fun after the dinner. It means that students are willing to make friends with each other.



Last but not least, it is pleasure to enjoy the wonderful meal in Sunway Resort Hotel & Spa. Some delicious shrimps, fish and the special desserts with the excellence, elegant environment made us a memorable dining experience. We appreciate and thank ASHRAE Malaysia Chapter to organize this CRC Banquet dinner with an excellent performance.



6. Technical Visit - Daikin



Daikin Industries, Ltd. is a Japanese multinational air conditioning manufacturing company headquartered in Osaka. It was founded in 1924 as Osaka Kinzoku Kogyosho LP by Akira Yamada. In 1953, Daiflon or polychlorotrifluoroethylene was developed. In 1963 the company was renamed Daikin Kogyo Co Ltd and developed Neoflon. In 1982 it was renamed to the current Daikin Industries Ltd. It entered the North American air conditioning market in 2004.

The staff in Daikin first introduced the basic concept of HVAC system, there are three types included Chilled Water Storage System, District Cooling System and Direct Chill Water System. Two main types of chiller were introduced, air cooled chiller and water cooled chiller. They showed how the chiller produces chilled water and deliver the chilled water to the air handling unit and fan coil unit. They also introduced chiller component, such as evaporator, condenser, different kind of expansion valve, controller, compressor and refrigerant. After that, they lead us to the factory and show their manufacturing process, the method they use to test leakage, etc. Finally, there was an opportunity to go to the roof and watch the cooling tower operation.

7. Technical Visit - Intrix Hot Water System



Intrix Renewable develops and manufactures products and system integration by providing renewable energy heating solutions to residential, commercial and industrial sectors. The group of companies has extensive expertise in Product Design and Engineering, R&D Contract Manufacturing and is well known for Product Safety Approval, Intellectual Property Licensing and Supply Chain Management. Their products include residential heating, renewable heating/heat pump and thermal energy storage/calorifier. We joined their workshop at Sunway Clio Hotel. There were four sections, the first one is the introduction of Sigma Storage Water Heater. The material they used and the safety measure were introduced

The second section was the introduction of Multipoints Tankless Heater. Multipoints means that the heater can provide hot water to multiple outlets such as the basin, shower, bidet and bathtub. It is also able to consistently maintain the set temperature of flowing water even at low flow rate of 1L/min. The water tank can be concealed so that the room will have better appearance. After this section, there was another staff introduced their hot water system using heat pump. He first talked about the operation principle of heat pump and two types of heat pump, air source and water source, then he present the component and operation of hot water system. In the last section, we are invited to visit their hot water system plant located on the roof of Sunway Cilo Hotel. We can see the calorifier, heat pump and storage water tank there. The staff explained the process of how the water is heated and delivered to the customer.

8. Technical Visit - Truwater



In the first section of the visit, the staff of Truwater introduced their business. Truwater is a manufacturer specialized in the wet and hybrid type cooling tower. In the last 20 years, Truwater has constructed very highly efficient and environmentally friendly cooling towers for the air-conditioning, power generation, biomass co-generation, petrochemical, chemical, oil & gas, steel mills, food and other processing industries. Engineered from a choice of available material ranging from timber, steel, concrete and even of composite FRP structures combined with various configurations of fill packs designed specifically for both the mechanical draft counter-flow or cross-flow applications. After that, their staff introduced us the fundamental of cooling tower. For instance, the concept of the cooling effect, types of cooling tower and the criteria of cooling tower selection.

Then, we visited their factory after we had a delicious local meal. We had a chance to climb on the top of the cooling tower and take a look of the real cooling tower, as well as the installation process of it. Moreover, we saw a new product invented by Truwater which implants the AI to control the fan of the cooling tower, such that energy consumption can be reduced during part load condition. In addition, we saw different kinds of fill invented by Truwater. "Fill" is a medium that used in cooling towers to increase the surface area available for the water. Different shapes of fill can affect the efficiency of cooling tower. Therefore, those are the secrets of their businesses and different manufacturers have their own technology of fills.



9. Technical Visit - American Air Filter



AAF Flanders is the the world's largest manufacturer of air filtration solutions, operates production, warehousing and distribution facilities in 22 countries across four continents. AAF Flanders is committed to protecting people, processes and systems through the development and manufacturing of the highest quality air filters, filtration equipment and containment housings available today.

Before the visit, the staff introduced us the business of AAF and their products. They provide services for residential, commercial and pharmaceutical. Moreover, he introduced us the 4 mechanisms of air filter, straining, impingement, interception and diffusion. During the visit, we went to the production center of air filtet. The hygiene control is very tight, everybody had to wear the protective clothing and passed through the air shower room. Their quality control is also very strict, every air filters will be test by the specific machines brought from Germany and a report will be conducted for each air filters. Then, we tried to assemble the air filters, it was a golden opportunity for us to DIY an air filter. It was not as easy as how the technician did. We really appreciate their hard work.



10. Technical Visit - Japan Air Filter



JAF, an air filtration company, which is established in 1960, has provided extensive Air Purification Products and Solutions across the world. Through JAF, customer can enjoy quality, reliability and sustainability products, improving indoor quality and protecting the environment.

In these years, with the one of the core objectives of JAF is to expand its businesses to the world, first factory overseas is in JAF Malaysia opened in 2015. The one followed by is JAF Singapore in 2016, JAF Thailand in 2017 and JAF Indonesia in 2018, to make quality air purification solutions more easily attainable and beneficial to every level of the society.

With different kinds of pollutants to be prevented, to effectively filter and protect the users from it, JAF provide four categories of air filter: primary filter, secondary (medium) filter, chemical filter and HEPA filter. The manufacturing process and repairing of different kinds of air filter was shown in technical tour.

A wide range of applications for the products by JAF Malaysia:

- Commercial Building
- Microelectronics
- Pharmaceutical Industry
- Hospital and Healthcare facilities
- Chemical Contamination Removal Systems
- Gas Turbine Air Intake Systems

TerraComb™ filter modules are manufactured with highest quality activated carbon media powder which is extruded in cell cubes of many small parallel compartment. When gases or air flows through the TerraComb™, the construction of small size cubes of carbon grid arrangement will generate turbulence flow. It helps to increase the media contact time with the pollutants and in turn increase the removal efficiency. The cells block can be framed with a metal or plastic casing, which have no much different in typical usage, in standard or customized size filter modules.

11. Technical Visit - Yilida



Yilida, a central air conditioning company, which is established in 2017, has provided full range of commercial air conditioning fan and building ventilator to customers in Association of Southeast Asian Nations and middle east countries. Through Yilida, customer can enjoy smart and sustainability products, and for the green building.

In the start of the visit, the staff of Yilida introduce a new feature products "IMD". It combines the Interior Permanent Magnet Motor and Inverter to offer the outstanding energy-efficiency covered the entire range of speed and loads. By applying this system, it can save space, energy and reducing cost. It has high efficiency with the IE5 Permanent Magnet Synchronous Motor and high torque at low speed sensorless control, easy to be installed and operated and multiple kinds of software related: RS485 communication, LED display, Bluetooth.

Afterwards, the staff introduce us the fundamental process of the manufacturing process of the smart energy-saving fan which can be separate into four procedures. They show us the different change in the fan in each process, from the fan shell to the modify process. The picture upward shows how they demonstrate the merging process of the fan and the testing process is shown downwards. They then told us how to fix the fan with the small metal, by adding each small metal in different degree and distant on the fan to adjust an average wind speed for the fan.

4. STUDY REFLECTION & LEARNING



CHAN Ka Chun, Thomas (Thei)

Firstly, I was delighted to participate in ASHRAE Malaysia tour which was organized by ASHRAE Hong Kong Chapter and student branches for joining an 22nd Chapter Regional Conference and studying the knowledge of HVAC. The aim of this study tour is to increase advanced energy technology design and promote international exchange. Overview the study tour, it have given me an unforgettable and remarkable experience.

On 20 August 2019, we visited the ST Diamond Building which is a green building in Putrajaya. The green idea of this building have awarded Green Building Index(Platinum), MGBC leadership in sustainability award, etc. The targeted BEI in this building is to achieve 85kWh/m²/yr. Most of the new green building design ideas have be impressed to me. Tannenbaum reflector panel on level 4 and 5 can reflect the direct daylight to the lower level for providing lighting and reducing energy consumption. Moreover, lighting sensor will detect the change of the daylight to avoid glare. To reduce heat gain caused by daylighting, insulated concrete roof are used to avoid high cooling load and the self-shading can block out the solar radiation. Apart from this, the rainwater pipes are installed in the roof for rainwater harvesting, water fittings and drip irrigation. Also, photovoltaic panels are installed in order to reduce unnecessary energy consumption. After visiting this building, we went to Malaysian Chinese Museum for learning the history and culture of Malaysia.

On the next day, we came to UniKL MFI and UTAR Sungai Long Campus for academic exchanges. The local students and lecturer showed us the HVAC equipment in laboratory room, school library and building scale model. We saw the AHU, heat rejection system, chiller control panels, etc. I felt delighted to visit these equipment and student's scale model.

On 22 August 2019, we visited a Pertubuhan Akitek Malaysia (PAM) which is a low energy consumption office building. In this building, it normally have the rain water harvesting system, photovoltaic panels, low-E glazing, landscape, etc. Significantly, I was impressed by the natural ventilation to maximize thermal comfort without any windows. It also maximize the natural day lighting and visual comfort. I felt it is awesome and feel comfortable in this building design. In the afternoon, during the RP bowling competition activity, I had a chance to make some new friends and played with them. It provided a good interaction with each other.

In the CRC banquet dinner (23/8), there were many students who came from different places such as Macao, Philippines, Taiwan, etc. It allowed me to have a communication with oversea students. Also, different performances were shown in this dinner for culture exchanges. It made me feel excited and delighted. In our performance, I did enjoy the song of "Imagine" which was sung by John Lennon. Although we felt nervous, we did it fortunately and successfully.

Furthermore, the study tour has arranged CRC technical visit. In Truwater Cooling Towers Sdn Bhd, we can saw the new product of cooling tower. The staff introduced the pros and cons of air cooled cross and counter flow cooling tower to us. Most importantly, the staff taught a lot of history, different designs and the construction components of cooling tower. It was my first time to see a cooling tower product and knew more detailed information of heat rejection system. I gained a lot of knowledge of it. In American Air Filter Company (AAF), we had a chance to assemble a filter product and visited filter factory. It was a valuable experience to me.

In near future, I hope that ASHRAE tour can attract more students to participate with this meaningful activity. I would like to give my appreciation to the students who came from different places. Lastly, I would like to thank everyone who prepare and organize this study tour that give me a special experience.



CHAN Sui Hing, Gold (Thei)

As time goes by, I have missed the period of 7-day Malaysia Study Tour because of the unforgettable experiences. It is tough to believe that the one-week tour have been finished. As a result, I would like to thanks ASHRAE Malaysia Chapter for organizing the meaningful 22nd Chapter Regional Conference and supporting the tour Malaysia. In addition, this is the first time going to Malaysia and thus I would never forget every minute that I have spent in Malaysia.

During this fruitful trip, I have gained generous things including various people from distinct countries, inconsistent culture, technical knowledge and so on. In the second-day of the tours, the most memorable experience was the visit of ST Diamond Building. It is one of the lowest energy consumption buildings in South East Asia with diamond-shaped outlook. Most of the students shared with me that they are so pleased to stare the attractive exhibits and building elements. Moreover, another prestigious building is Pertubuhan Akitek Malaysia (PAM) where is visited on the fourth-day of this trip. It is also a low-energy consumption office building. In this way, the students are enjoying taking photos with these special building and sharing their opinions about the availability in Hong Kong.

Apart from that, I have known more the characteristic of Malaysia. It is awesome to meet the local student and tutors during the academic exchanges incorporating visits of UniKL MFI and UTAR Sungai Long Campus on the third-day of tour. They are very nice to introduce themselves and share local foods, the equipment of campus etc. Besides, it is delighted to participate in the competition of Bowling on fourth-day. In the beginning, I did not register any teams in this contest. Fortunately, there are a shortage member in the Malaysia team. Thus, when they ask some people to become candidates, I have no doubt that to be a member of them to enjoy the game. Although the result of Bowling of our team is not in a desired target, we are aimed at participation and make new fellows. These behaviours have let me know deeper about the malaysia and It is honors to make new friends from Malaysia.

After the end of that day, we have encountered on the fifth-day of CRC student forum and banquet dinner. On the morning of the fifth-day of CRC technical seminar, I have downloaded the PowerPoint to interpret what the speaker says rather than taking photos. Because in the early visit of building and institution, the record of the PowerPoint by phone slide are not convenient to find out. On the night of CRC banquet dinner, we have performed the song of "John Lennon - Imagine" and the song of "Beyond - The Glorious Years". To prevent the abortive performance, we have practiced these 2 songs many times and use the mobile phone to stuck up as capital of "HK". Luckily, we performed not too bad and there are so many student thumbs up and all the people in this hall enjoyed the shows from different regions.

In the next day of final event of tours, the students are divided into a few groups to attend the CRC technical tour to gain the practical knowledge of the suppliers. In future, I hope I will come to Malaysia again and join with students from ASHRAE Malaysia and Singapore and Taiwan because I have already grossly miss them. Last but not least, I would like to thank everyone who have attributed to this tour for successful, especially Dr Sam Hui who planned extremely well for the whole trip. To the future participants, I hope all of you would try your best to make your tour interesting!



CHAN Si Tung, Brian (Thei)

It was my honor to join the ASHRAE Malaysia Study Tour 2019. Held between August 19th and 25th, the seven-day study trip gave me a fruitful and unforgettable experience in this country. It can not only enhance my communication skills and leadership but also expand my horizons, knowing the culture of Malaysia. In this trip, there are several experience is unforgettable.

For example, on day 2 afternoon, we have a visit to the Pertubuhan Akitek Malaysia (PAM) Centre Bangsar, one of the most famous low energy consumption office building in Malaysia, located in Putrajaya. Pertubuhan Akitek Malaysia (PAM) Centre Bangsar, through the PAM Education Fund (PEF), decided in October 2010 to purchase a four-storey building on Jalan Tandok, Bangsar with the initial intention of developing it into an architect driven centre for contemporary arts, in the spirit of the National Art Gallery and Museum of Modern Arts (MOMA) in their formative days.

In this visit, we have learned the latest energy saving technology in Malaysia. According to the local guide of the PAM Centre Bangsar, there are mainly eight passive energy efficient ideas adopted in this office building, which are to maximise the use of natural day lighting, to maximise natural ventilation/thermal comfort, the reuse of existing structure, to reduce heat gain and glare, to maximise views /visual comfort, greenery, innovation and building materials. One of the most impressive passive feature for me is to reduce the heat gain and glare. The 'Egg crate' sun shading devices and blinds of the building, which are provided at the northwest facade to prevent glare and heat from penetrating into the office spaces. The shading device negates 60% of solar radiation on facade glazing. Trees are also planted at the breakout spaces to reduce glare and provide shade to the northwest facade. The cold air trapped at the concrete wall at the southeast facing facade is released in the morning to cool down the building.

For the eight active energy efficient features in this office building, one of the most impressive idea is the automation of the building. The Building Automation System equipped with the Energy Management System to improve building energy consumption and user friendliness through control of general lighting via photo and motion sensors, energy monitoring via digital power metres, water usage monitoring via digital water metres, dynamic educational display and analyses of building energy performance.

After all, this study tour gives me a lot of chances to meet different people and learn about the Malaysia special culture. I am very pleased to join in this study tour and I also want to take part in it next year.



CHENG Ka Wai, Daniel (Thei)

During this meaningful trip, I visited different places and made connection to foreign students. Some of the local building is unique and contain the culture of Malaysia.

During the first day of visit, Dataran Pahlawan Negara, Istana Melawati and Putra Square represent the Malaysia culture, which combined with the cultures of China, India and Thailand.

For the second day of the trip, I visited the Diamond Building which is Environmental Department Headquarter of Malaysia. It is one of the most environmental friendly building, the Green Building Index is 88 which is the green standard of Malaysia. I had learned the basic procedures and techniques to be applied in order to achieve the green building standard. For the window setup, PV panel is applied to reflect the unnecessary light to the building.

For the third day of the trip, we had made academic exchanges for two University, which are UniKL and UTAR. We had visited the HVAC lab in UniKL, each of the component of HVAC system is explained. I noticed that technician of HVAC is not required licence, unlike Hong Kong, experience of work is enough. We had communication with students from UTAR, they guided us to make a brief walk-through to the UTAR, we visited the engineer my lab like the HVAC lab, Architecture lab, Material test lab, etc.

During the 4th day of our trip, we visited GBI & Pertubuhan Akitek Malaysia, which is a green building. There are lots of holes on the wall which indicates the ventilation to reduce the usage of mechanical ventilation. For the lighting energy saving, natural light is mainly used for day lighting. For the staircase design of the building, straight ahead design is applied, you can see the ground floor on the highest level of staircase.

The 5th day of the trip is CRC seminar. There are a total of two seminar was hold, which related to the energy saving and building integration on HVAC. During the first seminar, I understood more of the energy-saving technologies to be applied on the buildings in Hot and Humid Climates. For the second seminar, I learned more information of Mega Tall Building. Also, the consideration of HVAC design is different compared to other type of building, the structural system should be smart and safe, fire and lift safety is critical since the difficulty on putting out the fire by firefighters if the fire happened in a high level. The HVAC and MEP system must be good with operation reliability, flexibility and maintainability to reduce the failure of system malfunction.

In the 6th day CRC technical visit, we had visited DAIKIN, to the zone of assembled area. We are able to see the inside components of the chiller unit. The chiller simulation test is applied in order to understand the working environment of the chiller in reality. Also, the cooling towers of DAIKIN are visited, the type of the cooling tower is counterflow. For the next visit of technical visit, we go to Sunway hotel to listen the brief introduction of the heating equipment and heat recovery system. For the heating equipment, e-compact heater is an environmentally friendly option for heating. After the visit of Sunway, I understand that heating is low requirement in Malaysia since hot weather is happening in whole year. Some of the cooling generation is generated by heating process in order to reduce wasted energy and increase efficiency of energy use.

For the last day of our visit, we headed to the Personas Twin Towers, which is one of the landmarks of Malaysia. It's amazing to see the building since 88-storey twin toppers hold the tallest skyscrapers, which is still the only twin towers is capable to do it. And the iconic Sky-bridge not only to link the towers but also to keep them from swaying during high winds.

I am grateful to participate this study tour since it opened my horizons and make connection with foreign students who are studying engineering. Thanks to the effort of my teachers and schoolmates to support and organize the trip. Malaysia is an amazing place and I would like to visit again in future.



CHUNG Kin Chiu, Alvin (Thei)

It was my first trip to Malaysia and also an unforgettable trip for me. Compared to my previous trips in other countries, this 7-days Malaysia study tour let me broaden my knowledge a lot. In addition to visiting the buildings with historical and cultural values, I also visited some green buildings and technical sites that incorporate the latest environmental technologies.

In day 1, after we arrived Kuala Lumpur International Airport (KLIA) and checked in at the Everly Putrajaya Hotel, the tour guide took us to visit two famous buildings which are Putra Mosque and the Perdana Putra Building. The Putra Mosque also called the pink-domed Putra Mosque, it is the principal mosque of Putrajaya, Malaysia. In the past, non-Muslims who entered the mosque, needed to wear pink robes. Visitors wearing long pant can now enter without wearing robes, but not wearing shorts and skirts. The Perdana Putra Building is the Office of the Prime Minister of Malaysia. I do like the structural design of this building, it is combined Malay, Islamic and European cultures as such Palladian and Neoclassicism.

In day 2 morning, we visited Suruhanjaya Tenaga Diamond Building, it is a green building landmark in Malaysia and also in South East Asia. The design strategy included energy and water efficiency, indoor and outdoor environmental quality, and renewable energy. For example, Diamond Building installed tilting facade, it allowed self-shading for the lower floors, protection from direct sun rays into building and a smaller building footprint, resulting in a larger area for landscaping. Afternoon, we canceled our visit to Greentech Malaysia and PTM GEO Building and changed to visit Beryl's Chocolate Museum and Malaysian Chinese Museum. I knew more about the production line of a big chocolate brand and the history of Malaysian Chinese.

In day 3, we visited two universities, the first one is University Kuala Lumpur - Malaysia France Institute (UniKL-MFI) and the second one is Universiti Tunku Abdul Rahman (UTAR). At UniKL-MFI, professors took us to visit their campus and their HVAC lab room. They also introduced the post-graduate programme of UniKL-MFI to us. I think UniKL can attract students from all over the world to study here because the tuition is cheaper than other Southeast Asian countries, such as Singapore. Another university UTAR is a not-for-profit private university providing affordable quality education. I really like the environment and design there, and I feel that the campus is very large and comfortable. After the campus visit at UTAR, some local students from ASHRAE UTAR student branch invited us to visit the nearby night market. This night market is very similar to Taiwan's night market. I and a few friends have eaten local food and also durians! We ate D24, D101 and Musang King. The durians here are cheaper than Hong Kong.

In day 4 morning, we visited the new architecture icon in Malaysia, the New PAM Centre in Bangsar, Kuala Lumpur. It is a 10-story building which features black aluminum screening, concrete slabs and blocks, brick walls, steel staircases, exposed pipes, and green spaces inside the building to balance the space. Moreover, I participated in the ASHRAE Region XIII 2019 CRC RP Bowling Tournament at that day. ASHRAE Hong Kong chapter has three student teams (four bowlers per team), and finally I got the second runner-up. After the competition, we checked in at the Sunway Pyramid Hotel.

Day 5 and day 6 were the CRC section. In day 5, we had technical seminar in the morning and the topics were (1) Emerging HVAC technologies for energy efficient healthy buildings in hot and humid climates, and (2) Tall Buildings HVAC design and Integration challenges – with case studies sharing. After seminar and lunch, we joined the CRC student competition, playing games with other students from different countries such as Philippines, Thailand, Taiwan and Malaysia. At night, all chapter participated in the CRC banquet dinner, and each chapter had a night performance. We sang two songs during the night performance section, these two songs were Imagine by John Lennon and Glorious Days by Beyond. For me, I pretty like the traditional dance of the Philippines. In day 6, I participated in CRC technical tour at Daikin Refrigeration Malaysia Sdn. Bhd. to visit their AHU and chiller plant factory, and Sunway Clio Hotel to visit the Intrix Hot Water System.

In the last day, I went to Kuala Lumpur City Centre (KLCC) and visited Petronas Twin Towers with my friends. Unfortunately, we don't have much time to go up to the Twin Towers and only be able to buy some souvenirs nearby, I hope to visit Malaysia again in the future!



LAM Cheuk Fung, Wilson (Thei)

The ASHRAE Malaysia Study Tour 2019 was an extremely rewarding and amazing experience. The trip had given me the rare opportunity to learn and observe about HVACR related topics outside of Hong Kong. Participating as both a student and HKC students activities committee member allowed me to experience this event to the fullest. I had a glimpse of the hardship and dedication it required to organize events of this sale last year in Hong Kong's CRC and it was extraordinary to partake and witness the success of Malaysia Chapter's 2019 CRC.

The technical seminars and visits of this tour were inspirational and it was particularly interesting to me how engineering principals could be adopted and applied differently in foreign countries. I was able to witness Malaysia's engineers' strategies in energy savings as well as combating their specific climate related challenges. The visit to the ST Diamond Building was the most memorable as I was intrigued by its slanting façade and energy efficiency orientated designs. The building's daylighting design and the implementation of photovoltaics were eye opening and I believe that these strategies could be adopted in Hong Kong to enhance our building's sustainability as well as reducing our energy consumptions.

The academic exchanges in UniKL and UTAR provided me a sense of unity with engineering students in Malaysia as I learn that we are all on the same path facing similar challenges and aspirations. The academic visits had also brought me unexpected friendships, which I will continue to cherish for the years to come. I believe that the passion and hospitality of Malaysia students of UTAR should be something that we can all learn from. It was also interesting to see familiar experiments and learning apparatus at universities overseas which suggests that our learning programs are synchronized in some fashion.

As the student leader of this study tour I was able to develop my leadership skills and enhance my interpersonal skills. From the preparation, organization and the execution of this Malaysia study tour, I have gained a deeper appreciation for the importance of teamwork and effective communications. The success of this study tour, including our cultural performance & RP bowling results, would not be possible without the cooperation and support of my peers and fellow participants of Hong Kong. Lastly, the CRC banquet dinner was the highlight of this trip as I was reunited with familiar faces and accompanied by new friends from the ASHRAE family. The cultural exchange and the sense of unity present at the banquet dinner could not be fully expressed by words and it was nothing short of amazing. I believe that the CRC banquet dinner should be experienced by every student as it is an extremely rare opportunity to have hundreds of engineers and students from different countries and cultures exchanging ideas and networking at the same time.

I would like to take this opportunity to give my sincerest thank you to the following people and organizations in no particular order:

Thank you ASHRAE Hong Kong Chapter, THEi & VTC for sponsoring the trip, Dr. Sam hui for organizing and leading the study tour, ASHRAE Hong Kong Chapter committee members for their support, my peers and study tour participants for being great team players and last but not least, thank you ASHRAE Malaysia chapter and students of UTAR for taking care of me.

I will always treasure the old and new-found friendships in the ASHRAE family, see you all in the next CRC.



LAM Check Yung, Billy (Thei)

In this Malaysia study tour, I visited many famous places, green buildings and universities. Since it is my first time to travel in Malaysia, it was a great opportunity for me to observe and learn about the cultures and green buildings in Malaysia. During in this week of study tour, I also participated many activities and events which I had impressive feelings and rare experiment.

For day 1 of the study tour, we had visited the Putrajaya after checking in for hotel. The local guide introduced detail history and development of Malaysia during visiting. Therefore, I could have better understanding about the background and culture of Malaysia. Apart from government buildings, it could be found some cultural buildings which contain combined architecture design, including Chinese, Thailand, Islamic and Malaysian. We also visited the pink mosque which is a temple of Islam containing beautiful Islamic architecture design.

For day 2, we visited the ST Diamond Building which contains many sustainable designs, such as daylight design, renewable energy system and HVAC design. During the visit, the staffs showed and introduced the Floor Slab Radiant Cooling system. I could realize the operation and benefits of this cooling system. Also, I observed the solar energy system at the roof of building. I could learn that the renewable energy strategies in green building, and the integration of installing photovoltaic panels with architectural design. Moreover, we visited the Malaysian Chinese Museum, it is a great experience for me to learn about the history, development and cultures of the Chinese in Malaysia.

On day 3 of the trip, we had visited 2 Malaysian universities which are UNI KL - MFI and UTAR. In UNI KL – MFI, we attended the presentation of HVAC and visited the campus. Also, we visited their HVAC laboratory where I could observe the testing process of chiller system, AC outdoor units and AHU. Thus, I could obtain better understanding about the operation of chiller system and AHU. In UTAR, I participated the student forum that I could talk and make some friends with the Malaysian students. I could know about the differences in cultures and education of Malaysia and Hong Kong through talking with them. After that, we visited their campus and different engineering laboratories which are very professional.

On day 4, we visited The New PAM Centre which is also a famous green building. This building contains plenty of openings, vertical staircases and open areas which can perform great ventilation in the building. Thus, the energy consumption on HVAC would be reduced. Also, the open design would direct more daylight which reduces the use of artificial lightings. I could realize that green architectural design would enhance the energy efficiency by reducing the rely of using BS equipment. After that, we participated the bowling competition which is a great experience for me to enhance my team spirit.

For day 5 of the trip, we attended the CRC technical seminar. I could learn about improving energy efficiency of HVAC system with climate condition. Also, I could know about how the HVAC system design integrated with architectural design. Those are very useful knowledge that can improve my understanding on designing and learning HVAC systems. Moreover, I participated the CRC student competition and forum. I was very happy that I made some friends with the students from other chapters. After that, we attended the banquet dinner and had a singing performance which was an impressive memory to me. On Day 6, I visited "TRUWATER" which is a cooling tower manufacturing company. The staff prepared a presentation for introducing the development history and different type of cooling towers. Moreover, I observed the production process of some components of cooling tower. It could enhance my understanding about the components and operations of different type cooling towers. Also, I visited "AAF" which is an air filter manufacturing company. I could observe the production process of air filters by visiting their factory. I could realize the requirement for filters production, and testing process and types of filters. For the last day of the trips, I visited the Petronas Twin Towers which is very impressive to me. The towers contain beautiful architectural design which is unique and amazing.

In conclusion, I am glad that I could participate in this Malaysia study tour. I could visit many green buildings, universities and manufacturing companies. It is a very good opportunity for me to learn the knowledge of HVAC systems and equipment. It is also a great experience for me to realize the cultures of Malaysia. I was very happy to join this study tour. Thus, I would like to say thank you to ASHRAE, my teacher and schoolmates.



LAM Hin Shun Thomas (Thei)

In this meaningful Malaysia Study Tour, students are able to exchange ideas with foreign participants by visiting the local university, participating the CRC Student Forum and creating musical performance during the Banquet Dinner. Students are able to exchange the personal contact so as to become an everlasting friend. Meanwhile, while visit the ST Diamond Building, True water-cooling tower and American Air Filters Factories (AAF), undergraduates may apply knowledge in new energy technology, environmental-friendly design and imaginative thinking. It thus beneficial to our further study and future career.

Firstly, during the University Exchanges and CRC Student Forum, Hong Kong students may gain chances communicate with foreign participants, such as introducing the oversea cultures, guiding us to night markets, and capturing the funny group photos. Apart from it, there are exciting Team-Building Competition in student forum. Undergraduates from different countries are required to tighten the fabric textiles, wander with corresponding pattern and transport the water bottles to the final position. Even though our groups face challenges and failures, we could ultimate finish the difficult tasks with modified solutions. The cheers and supports by other students also contribute to our success. Furthermore, in order to keep contact in future, some students exchange email address, Facebook and Instagram title. Some even desire to take part in next year ASHARE CRC student activities which is held in Indonesia and also go sightseeing in this amazing city.

Moreover, during the CRC Banquet Dinner, students from different countries, including the Tai Wan, Thailand, Malaysia, Philippines Chapters and so on have created an extra-ordinary performance. Via singing, dancing and talent shows, we gain a deep understanding of foreign cultures. We highly appreciate the efforts spent by students, professors and organizers. Meanwhile, Hong Kong Chapters sing popular songs, including the Imagine by John Lennon and Glorious Years by Beyond. Students switch on the mobile lamps, create brightness on stage and shut out Fight for Hong Kong, so as to show their supports on democratic protests. On the other hand, it is pleasure to enjoy the awesome dinner. We are able to try delicious main dishes, which includes sweet and sour pork, roast goose, wind sand chicken, fake fin soup and so on. Meanwhile, we may order drinks at any time, such as Coca Cola, orange Juice and Tiger beer. Even though some students face turn immediately, they continue drink beers due to their happiness.

Furthermore, we have visited the innovative ST Diamond Building and PTM GEO Building. Due to the hot and humid climate in Malaysia, engineers apply various sustainable features to utilize the renewable energy, maximize the water recycling and minimize the excessive heat gain. For example, the sloping roof for Solar PV Installation Purpose, Glass Entrance Canopy with Water Element and Tall Tree Lined with Streetscape for Cooling Effect may achieve the green building purpose. It thus reduces the electricity demand, improve the users' comfortability and achieve a higher ranking in Green Building Index (GBI). Moreover, the Technical Visit to the True water and American Air Filters Factories (AAF) furthers enhance our knowledge in HVAC Design. We may realize the operating principle of HVAC Equipment, discover the manufacturing process of Cooling Tower and Air Filters, and play the 5D Virtual Reality (VR) computer games. It thus beneficial to our further study and future career.

Ultimately, we should say thank you to all teachers and helpers who help organizing this wonderful Malaysia Study Tour. Via the Technical Visits, University Exchanges and ASHRAE CRC Activities, I have discovered the advanced knowledge in HVAC Design, understood the local history and cultures, and created an everlasting friendship with other students. Hope we can join the ASHARE activities, especially the CRC Student Forum, Technical Visits and Banquet dinner in the coming year.



LAU Ka Kit, Gary (Thei)

During this exchange, I had known more about the culture of Malaysia in the daily life. The aims of this exchange are to either sight-visit the Air Conditioning Factories of some popular companies or the social culture to have the experience. This is my first time for visiting the Malaysia. I think it is a great place to manage the common brand under the regulation and laws.

On the first day, the trip was going to Pujakaia to have basic knowledge of Malaysia, including history, finance, government department, lifestyle, etc. By the local guide Miss Cas. I can understand more detail of the place.

For sight-seeing of the diamond building, it is a famous building in Malaysia which is a green building with low energy consumption. There are seven features to minimise the energy use, including dome design, photovoltaic panels, rain watering tank, motion sensors, low E and glazed glass. It is a perfect sample for us to be reference for consider those functions which can be used in the following days becoming an engineer. As Malaysia has more green buildings, Hong Kong has only a few of them, which is Zero Carbon Centre, T-park, etc. Green building has higher energy efficiency with less carbon produce. During the sight-seeing, I think Hong Kong can develop a green building society with protection of environment. Development of green building is future technical project which is either good for people healthy lifestyle or lower cost.

For visiting two universities, I can have chance to communicate with the local students to talk about the and share their study and daily life. Furthermore, it also enhances my knowledge of the school.

After that, we have joined the ASHRAE collection. As a person of Hong Kong Chapter, I was glad to have the meeting of three professors to direct present their views and more details of the HVAC system. It was a great chance for me to strengthen the skills of providing a great system with environmental friendly.

At the last two days, we have CRC Technical Visit to go to big manufacturer of two popular companies which are in processing the units of HVAC systems, including Japan Air Filter (JAF) Malaysia and Yilida. JAF is mainly producing different types of filter which filter out difficult impurities of the places like hospitals, shopping malls, etc. Yilida is a company which produce high efficiency of fan coils which is providing as air handling unit.

After this exchange, I can either strengthen the knowledge of green building, which including better power efficiency of HVAC System, or the daily lifestyle of Malaysia.



IP Ka Wun, Cat (Thei)

I am deeply thankful to the Hong Kong Chapter donator. I have an amazing experience in this study tour because this study tour can give us a chance to have cultural exchange with different countries students. In addition, ASHRAE arranges us to visit the factory to understand the proceed of producing some equipment in building service. During this study tour, I learnt different kind of mutual communication and broaden my mind in building services knowledge.

The most profoundest activity is visiting the campus and green building in day 3 and 4. We visited two universities, which called UNI KL-MFI and UTAR. Two university also have different experience and gain different knowledge. Since I learn some academic knowledge in UNI KL-MFI, but I make friend during the exchange. In the morning, they have the presentation about the HVAC in UNI KL-MFI campus and bring us to walk around the campus. After having the lunch, it is surprised to me is there is a HVAC laboratory, where included completed HVAC equipment. Therefore, we saw the completed process of operating. In the afternoon, we visited the UTAR to talk with the local student after finishing the respective presentation. Their presentation sound like interesting because it contains some difference between Malaysia and Hong Kong.

After visiting this campus, I broaden my cultures mind in Malaysia. On the other side, we have the courage on the previous step, we may make more friend and widen various knowledge. At last, we visited their huge campus, which provide lots of engineering equipment and laboratory for studying. The deep impression is the equipment for collecting sound, because I saw that equipment in first time and this equipment have high accuracy. In day 4, we visited the well-known green building, which is called the NEW PAM Centre. There are the lots of design can enhance the ventilation efficiency and allow more daylight entering in. I hope those design can widely applying in the building of Hong Kong. After the lunch, we joined the bowling competition and make some friend from Malaysia because we have the communication during proceeding. Luckily, the girls team got the second prize in this match. I think the team spirt is important because we support each other in the whole match.

The CRC activities held in day 5 and day 6. In the first day, the technical seminar have several engineer to have the presentation, which talk about energy efficiency of HVAC system and the architectural design blending in the HVAC system. This kind of knowledge also can enrich my HVAC system designing mind. Furthermore, the CRC student competition is held in the afternoon, we made friends from different countries chapters and played the game with them. It seemed like fun in that day. At last, we have the banquet dinner and watch different countries performance. The most profound is the Malaysia performance because their performance have the dancing the singing, it is so attractive. In the next day, we visited two factories, which are Japan Air Filter and Yilida Industries SDN. BND. Those factories produce the air filter and fans respectively. In JAF, we saw the proceed of producing the air filter. It is supersized to me is some steps was proceed by handmade not the machine. In the Yilida Industries SDN. BND, we saw the completed proceeding of producing fan and knew how they finish the certification for each fan.

In general, there are the advanced engineering technology and design in Malaysia, which applied the sustainable design in the building to reduce energy consumption. That information totally break my first impression of Malaysia. I felicitate to join this study tour, because it can give us a chance to visit the campus and the factories to enrich our building services knowledge. Also, this study tour give us an opportunity to use other language to express ourselves during exchanging. At last, I gratitude to Hong Kong Chapter, my campus and my teammate again.



LING Jing Tung, Esther (Thei)

I am so glad to be one of the participants of this study tour, it was a rare chance to explore Malaysia in a very different way. Malaysia is quite special and unique, it is a multicultural country with Malays, Chinese, Indians, and other indigenous Bumiputra groups. It is not difficult to figure it out especially when you are finding a restaurant for dining or visiting architectures in Malaysia. The best way to explore this fantastic and pluralistic country is to visit their place by your own self. Fortunately, we were given opportunities to go to different buildings and universities for technical visit and academic exchange. The ST Diamond Building, which is the headquarter of the Energy Commission, was the first spot of our technical visit. Efforts are paid to maintain the sustainability of the building such as solar panels installation, motion sensors for lighting etc. Also, thermal insulated concrete can be found on the rooftop which aim to reduce the heat absorption and lower the uses of air conditioning. The ST Diamond Building has inspired that green building is not just consider about the services within the building, but also the building design and materials used. The appearance of ST Diamond Building is a great example to explain how building design can affect the sustainability of a building. Large landscaping area can be found as adequate ground space are provided due to the inverted pyramid shape, at the same time, roof space has been maximized for solar panels installation. After the first technical visit, we went to two universities which were UniKL MFi and UTAR Sungai Long Campus respectively. We met the local students during the academic exchange, and they gave us campus tour to take a look. Furthermore, we have joined the Ashrae student program and visited numerous factories. I was arranged to visit Daikin and Heat pump system in Sunway Clio Hotel. In Hong Kong, we have been to Daikin showroom before and learnt about the VRV system. However, it was a bit different this time, besides introduced the basic concept of air conditioning, it also focus on the manufacturing process which was a new experience for me.

This study tour was more than just enhancing your knowledge on engineering or the concepts on green buildings, either the university tour or the CRC program, it gave you a chance to meet some new friends came from other places like Taiwan, Thailand, Philippine etc, of course also Malaysia. For me, I met a Malay young girl and we chatted together during the university tour, from school life to daily life. She is super kind and friendly, it seemed like we are old friend. Through the conversation, I learnt more about their traditional custom and history of their country. Nothing better to understand the culture of a place than communicating with locals. After the academic exchange, they brought us to the local night market and recommend us some local food. What's more, the student forum during CRC program has joined all the students together as well, even though we have different cultural background, at that moment, it seemed that all the barriers between us has disappeared. The banquet dinner was another spot of CRC, it has gathered every chapters from region 13. Some of the participants have put on their traditional costumes and performed their traditional music instrument and dance, it brought me so much fun.

It was an incredible study tour and I will never forget everything that happened in Malaysia, what we have done and experienced. Of course, I won't forget the moments that how I and my friends enjoyed eating durian at the night market and durian stall. Special thanks to the local student leader who brought us to eat delicious and local food during the CRC program and also being so nice and patient to us.



LOK Wing Han, Han (Thei)

This is the first time I participate in ASHRAE study tour. It is my honor to be one of the participants. Seven days in the study tour flies too fast. There are many priceless memories and friendships created in the trip. It will be one of the most unforgettable moments of my life. For this study tour, we had played a fruitful amount of team building games, visited famous tourist spots and went shopping in the night markets with students from around the globe. I realized enthusiasm could overcome the barrier of languages. No matter where we come from, we could still play together as if a family. It is a treasure experience.

During this study tour, we visited many famous tourist spots. There are Masjid Putra (pink mosque), Malaysian Chinese Museum, Suruhanjaya Tenaga Putrajaya & ST Diamond Building, Beryl's chocolate factory, Pasar Malam Taman Connaught, The New Pam Centre. My favorite tourist spot is Masjid Putra (pink mosque). The reason is that I like to learn more about the local culture, religion and background of different countries. This is a place where I can find calm and serene within.

My most profound activity is Ashrae Region XIII CRC PP Bowling Tournament. I am very fortunate to be part of the exciting competition. I think that sport is also a common language in the world, a fair game can bring people closer to each other and allows us to show sportsmanship. It's no longer important to insist on losing or winning at the last minute.

For the academic visit, we visited two local universities. There are UnikMFI and Universiti Tunku Abdul Rahman. The two universities give me a different feeling. UnikMFI can make me feel the local culture more, because its environment is closer to nature, there are none that can compare with UnikMFI in Hong Kong. And Universiti Tunku Abdul Rahman is similar to a university in Hong Kong, full of sense of the times, being part of the metropolis. Through the introduction of the universities of Mr. NG Wen Bin and Mr. KING Yeong Jin, I am very interested in studying in the local area. I only visited it for a few hours. I really don't feel enough! If this event is held again, I will definitely participate!

As for the Chapter Regional Conference, it was held at Sunway Pyramid Hotel. The hotel is one of the largest hotel developments in Greater Kuala Lumpur, integrating a complex of five hotels with 1,234 guest rooms, suites, luxury villas and serviced residences. This place is very similar to Macau, except there is no casino, I feel a bit of a fly in the ointment. However, CRC's activities can make up for this loss. Because I can learn some knowledge about HVAC through these activities. Knowledge is more important than money!

Concerning the CRC technical tour, my site visitations are Daikin and Sunway Clio Hotel (Intrix Hot Water System).

During the Daikin, I can see the components of different HVAC machines. This is an unforgettable experience. I am glad to see these components as there are rarely found as individuals in Hong Kong, because the HVAC machine sent to Hong Kong is already assembled and will only be disassembled during repair.

On the other hand, I have seen heat pump system in my place of work in Hong Kong. I am here to visit the local hotel heat pump system. I can benefit a lot because the difference in height, size and climate will affect the design. In here, I can learn more flexible design.

Finally, I am very fortunate to be able to participate in this Malaysia Study Tour. Thank you ASHRAE for organizing such a meaningful event. I also thank members from all over the world for their contributions to this event. Everyone can have unforgettable memories.



PANG Wing Tung, Tung (Thei)

This is the first-time that I visit Malaysia and join the ASHRAE study tour. Malaysia is a different place rather in Hong Kong. Many traditional buildings are mixing style including Indonesia, China and Malaysia. There are many things different between Malaysia and Hong Kong like the building density, language, style of the building, we have visit some of the special building like Putra Mosque, ST Diamond Building. ST Diamond Building is the most memorable building during the tour. The building apply many green technology on it like the solar system, green roof, it is a pity that Hong Kong did not have such large scale green building because of the land resources problem. It is surprise that we have a chance to visit the local chocolate factory in Malaysia to know more about the step of produce the chocolate.

Luckily, we can visit UniKL MFI and UTAR Sungai Long Campus for academic exchange. Through the talk of the local student, I have known that the standard of two places is different but also for the same purpose. I have try the local food call 'dog poo' and the spicy food in UniKL MFI. I thought it is the most local food I ate during the trip. It's outlooking is bad but it is delicious. During visit UTAR Sungai Long Campus, I found that the equipment of the engineering in the laboratory are familiar in Hong Kong. After the visit, the student brought us to the night market which only open Wednesday and try the local food in Malaysia. It seems I am walking the night market in Taiwan, the food is international and I cannot distinguish the different between two places but it is an interesting experience. After visiting local school, I have felt the environment, equipment, people are nice in Malaysia. It's a suitable place to study.

For the CRC student competition and forum, I have met many students come from different countries. Through the competition to international students, it can let us have a chance to know more about each other. At the same day, we have the banquet with all of the students and the ASHRAE member, it is an amazing experience to me to have a formal dinner. Each country student has a show for the banquet, although we did not get any award in performance, I think it is a greatest performance for us.

For the CRC technical tour, I have visit two company which is Truwater and AAF international. For the first company I have learnt more about the system of the chiller and the water system history. Also, I visit the factory of the company to let me look for the real reequipments which cannot see during studying in school. For the AAF company which is produce the filler for the HVAC. During the visit, I have seen the procedure of the filler and some of the lucky students can make a filler be themselves. After the tour, we have the dinner with the members and celebrate the success of the CRC.

During the tour, I have earned and learnt lot of experience in communication and knowledge. The staff, members and student are nice and kind, even our native language is different. They try to use Mandarin or Cantonese communicate with us. Finally, I would like to thank all of you which let the tour have a successful ending, especially the members from Malaysia, also Dr. Sam Hui who arrange the interesting schedule before joining the CRC event. It's an excellent and meaningful memories and experiences in this summer. I hope I can visit Malaysia again in my life to know more about culture and visit more non-academic places.



TSANG Yee Ting, Taffy (Thei)

Thanks to the Hong Kong Chapter of ASHRAE, I had a wonderful week in Malaysia. During the study tour, I gained deeper knowledge about green buildings which was beneficial to my study and met friends with different cultural backgrounds. The advisor of the study tour invited a skilled tour guide traveled with us, we had learned so much about the Malaysian culture and history because she could speak in Cantonese. After we arrived in Malaysia, we had an additional culture visit in Putrajaya, and we had a lot of photography in their fascinating administrative and religious buildings. Those administrative buildings have a unique architectural style which integrates with Chinese, Indian and Islamic architectural styles.

On the second day, we had a technical visit to the local green building, ST Diamond Building. The building design won many local and international awards because it achieved excellent performance in saving electricity and water, adopting sunlight and reducing CO2 emission. For example, the design of the inclined window on the fifth and sixth floors can reflect the sunlight to the third and fourth floors, hence, to reduce the energy consumption on the lighting system. After the visit on ST Diamond building, we went to Beryl's chocolate factory which is a famous chocolate brand in Malaysia. In the factory, we knew more about the history and manufacturing processes of Beryl's. In the evening, we visited the Malaysian Chinese museum. The museum aimed to record the history of lives of Chinese in Malaysia from Ming dynasty to modern and evoke the Chinese identity of Malaysian Chinese as well. The models in the museum were extremely exquisite, especially as the giant boat of Zheng He.

We visited UniKL and UTAR universities on the third day to have cultural exchanges with the local students and campus tours. The architectural of student halls and main buildings of UniKL campus are similar to the administrative buildings in Putrajaya, the whole environment of UniKL campus make me feel relaxed. In the UTAR university, we met many Malaysian students and we exchanged a lot about the lives in Hong Kong and Malaysia. I was shocked by their language talent since they could speak at least four languages included Cantonese. In the campus tour on UTAR, they introduced their campus, facilities and university lives to us enthusiastically. After the campus tour, we went to the local night market and the students of UTAR were coming with us. They bought some local food for us, that made me felt warm and I enjoyed get along with them.

On the fifth and sixth days, we had several CRC functions included the technical seminar and visit, student forum and banquet dinner. I had learned a lot of professional knowledge in building services engineering, that was useful for my future study and career. In the student forum, we played some team-building games to familiar with the foreign students from other chapters of ASHRAE. The banquet dinner was the highlight of all CRC function, all chapters had their own performance on that night and through the performances, I knew more about their cultures. I appreciated the performance of Taiwan the most because their yoyo ball performance was stunning and eye-catching.

This was an unforgettable study tour in my life, all the friends from different chapters are kind and friendly. My friends from Hong Kong and I got some drinks with Taiwanese students in the bar at one night and I enjoyed shopping in Malaysia since the price was relatively cheap. As a student who is studying building services engineering, this Malaysia study tour is beneficial to my life, I can gain knowledge while having entertainment in leisure time. If you ask me whether I will join another study tour hosted by ASHRAE, I will definitely say yes.



WONG Wai Chun, Leo (HKU)

It is my first time to get to Malaysia as well as a memorable tour. Through the site visit and university exchange, my understanding about Malaysia and most importantly the BS knowledge has been enriched.

We have been to two universities, UniKL and Utar. Both are professional and impressive educational institutions which cultivate excellent and international students. I met three exchange students from France who shared his postgraduate studies and the livings in Malaysia. I was impressed by the HAVC facilities in UniKL. By visiting the cooling room, ice storage systems and well-established airconditioning cycle display, my HAVC knowledge have been enriched. The Professor in UniKL also gave an educational and practical lecture to us about the difficulties of getting master and PhD degrees which is beneficial to my career. On another hand in UTar, I met many polite and sociable Malaysia students. We share similar cultures and speak similar languages but met in different countries. I could understand the Engineering Industry from their kind sharing. Some of them even invited us to drink in the bar. Besides, 13 chapters from different countries gathered to have cultural and technical exchanges in CRC. We attended the student forum and banquet which allow us to cooperate and share with foreign students. Every student chapter performed in the CRC banquet and show their talents and dedication to ASHRAE. Thailand and Malaysia students integrated their history and traditional culture in their impressing performances. The exciting dancing performance from the Taiwan students was one of the highlights on that night. It was a wonderful picture which displays the union of the Asia ASHRAE Chapter and Engineers. The students and people I met in Malaysia are the most precious things I gained during the tour.

Apart from broadening social circle and universities gathering, we have been to various technical visits. The first site visit is the diamond building. This building as the pioneer of Green buildings in Malaysia has applied the concepts of utilizing daylight, chilled radiant slabs, and water reuse. In order to maximize the use of daylight, the building has adopted the diamond structural design, transparent rooftop and atrium, solar panels and light tunnels. For similar purposes, PAM center where is the second technical visit site also integrates the element of open rooftop and corridors. This kind of layout optimizes the natural ventilation and daylight which reduce the use of energy. Various architectural ideas and art elements are contained in the building which constructs the fashionable outlook. On the last day of CRC events, I visited two factories and know the manufacturing processes of air filters and centrifugal fans which reinforced my understanding of the mechanical real practice. In Japan Air Filter Malaysia visit, the technical staffs have introduced and shown the quality tests, staff training, assemble process, warehouse operation and chemical tests to us. I was amazed by the precise process of hyper-filter which is assembled in a few-dust environment. There is a quality checking process aiming to repair the holes in the filter. By putting the filter on the testing table in a dark room, the holes which allow gases to pass by could be easily identified. Furthermore, pressure drop and filter capacity are also important parameters in quality check. The Japan company not only emphasize a high standard and preciseness of the manufacturing process, but also provide a comfortable environment for workers. In addition, the mechanical processing in the Yilida Fan factory deepens my understanding of hand-on practices. The machines and facilities in the factory surprised me which cannot be seen in the university and allow efficient testing and assemble. The balancing checking of the assembled fan also linked with the knowledge taught in my university. The interactive demonstrations and patient introductions from the staffs during the visits make my study tour fruitful and joyful.



Gulzhan ALDAN (PolyU)

Being a first-year engineering student for me was very challenging not only in terms of program curriculum but also because of uncertainty about real-life implications of what I am expected to study in upcoming four years of my degree. A student technical study tour is a great opportunity for students to discover more about their future profession and I am very glad that I had a chance to know more about building services in a study tour held in Malaysia this year. Before going to Malaysia, I set up a goal for myself to get familiar with real-life examples of building services industries, however, I did not even expect how this study tour would expand my mind in many other different ways.

One of the important highlights of this study tour for me was a cultural enrichment and an opportunity to meet and communicate with the students from different countries. I met very open-minded students from Singapore, Malaysia, and the Philippines, and for me, as an international student who came to study in Hong Kong and not familiar with Asian countries, it was very exciting to know more about their cultures as well as to share with them about my home culture and my insights about Hong Kong. Most importantly, during the study tour, I got to know local students from different universities in Hong Kong. I learned so much about Hong Kong people's culture, by living and spending time together, listening to how they communicate with each other (even though I did not understand them), preparing together to the performance, having site visits together, I gained a much more authentic experience than I did in my first year of studying in Hong Kong.

Another opportunity I appreciated very much was the organized site visits to the industries related to building services engineering. One of the companies I visited was Japan Air Filter which is a leading provider of extensive air filtration across the world. During the site visit, I learnt a lot about the stages of filtrations, the types of filters used in different types of buildings, and the technology of how these filters are made and tested. One of the laboratories I visited was a chemical laboratory where people conduct different types of reaction to test the material and make sure the filters work appropriately. After this site visit, I realized that a building services engineer should be good not only in math and some physics-related subjects but in chemistry and biological sciences as well because the building services industry is not only about facilities installed it is, first of all, about human life and health security.

However, the most exciting part of this study tour for me was the CRC technical seminar in which I had a chance to listen to distinguished professors and engineers in the sphere of the built environment. I was very impressed by the researches and career insights they shared with us during the seminar. Especially, I want to highlight the presentation of the professor from the National University of Singapore, Chandra Sekhar, whose research on energy-efficient air-conditioning impressed me a lot and inspired me to study this topic further by myself. I find this topic very relevant and important to investigate because the implementation of technologies which consume less energy is a must for sustainable development. Another point highlighted by the professor was about the personalized air conditioning systems which I found very interesting to investigate as well. After the CRC technical seminar, I felt very inspired to study harder and to make a meaningful contribution to the built environment like the professors and engineers I met during the study tour.

I want to thank the ASHRAE Hong Kong Chapter and, especially, Dr. Sam Hui, who organized this wonderful journey and gave us the opportunity us to explore the different cultures and get to know more about the building services industry. The study tour was meaningful and unforgettable, and I would be very happy to join a study tour like this again.



FENG Zhuoxiu, Michael (PolyU)

There are a lot of “first time experience” for me in this trip. The first time to join ASHRAE study tour, first time to join CRC, as well as first time to go to Malaysia.

We have been to Putrajaya, a well-planned city and the federal administrative centre of the Malaysian capital. I did some comparison between Putrajaya (Malaysia) and Hong Kong (Central). The largest different is that the height of Putrajaya’s building is comparatively shorter and the population density is smaller. For the building in Putrajaya, their architect works really well so those buildings are very special and beautiful. The greening, the appearance even the energy saving of the building perform very well.

We visited two buildings. One building I really want to mention - Diamond Building. The ASEAN Centre for Energy has awarded its top prize in the ASEAN Energy Awards (AEA) to the Diamond Building, the eight-story headquarters of the Energy Commission (Suruhanjaya Tenaga) of Malaysia in Putrajaya. The passive-design, energy-efficient structure is designed to use mostly natural light and to consume about one-third the amount of energy of a conventional building of its size. The building, completed in 2009, earned Platinum ratings under Malaysia's Green Building Index (GBI) and Singapore's Green Mark program. It is topped with photovoltaic (PV) solar panels, which generate about 10 percent of the building’s energy. Rainwater harvesting systems save about 70 to 80 percent of water usage. The Diamond Building’s inverted pyramid configuration allows more roof space for solar panels and more ground space for greenery. The centrepiece of the building is a large central atrium designed to admit and regulate daylighting using “an automatic roller-blind system responsive to the intensity as well as the angle of the incident sunlight,” according to the Energy Commission. I think this building act like a model building for the future as there are so many new technologies in that period of time so that it comes with a high cost of maintenance fee. It helps today’s engineers to develop a better building services systems in modern building. The building cost is extremely high but it is meaningful.

Apart from green building visit, joining CRC is also memorable and meaningful. It is great for BSE students as it has a technical seminar which is about HVAC and tall building. We also met different students from different countries. We had some activities which is really fun. Furthermore, it provides us chances to meet some HK engineers from HK ASHRAE Chapter. We also join the banquet dinner as well. There are various events including student performance and award presentation. It provides great opportunities for all participants exploring overseas culture and exchange with different people from different Asian countries. We also did a song singing. It is glad that the performance is quite successful even we had practiced few times. Students are work hard on reciting the lyrics. All students are willing to sing and the feeling is really great. CRC student program also provide us to have factory visit. I visited Daikin and Sunway Clio Hotel – Intrix Hot Water System. Daikin is the world largest HVAC equipment manufacturer. We attended a small lecture that showing us the simple refrigeration cycle, having a look on the cross-flow cooling tower, air-cool chiller and some heat exchanger. For Intrix, they showed us the centralized (Heat Pump) and decentralized (Water Heater Storage and Multipoint Instantaneous Water Heater) hot water system for commercial use and residential use. We also learned few things about heat recovery. However, they told me that due to its costs, developers are willing to use heat pump instead of heat recovery.

To conclude, it is a valuable. Thanks for Dr. Hui for his great contribution to this trip. He putted huge effort in this tour for real.



HUNG Wing In, Tracy (PolyU)

In this study tour, my image of Malaysia was updated and I had learned more about the technology of energy saving through the visit of green building.

This is not the first time that I visit Malaysia, this time I visit Malaysia with more engineering sense and in a study purpose. For the first time, I was a tourist and only focused on the entertainment whereas this time I focus on the building more, such as the energy saving element, appearance of building and city planning.

Putrajaya is the first destination in this study tour, we stayed there for about three days. It is near Kuala Lumpur, the capital city of Malaysia, and large number of government buildings located there. There are not many tourists attractions nor commercial buildings. Hong Kong is a city whereas Malaysia is a large country, there are many office of a government department located in different city of Malaysia. Putrajaya has most of the headquarter buildings, they are centralized in the same place, I think it is a special type of city that I have ever seen. Centralization makes the information of different government office will be delivered quickly. Some of these buildings include elements of different cultures. Malay culture, Indian culture and Chinese culture are dominating in Malaysia. Some government architectures includes characteristic of these culture. Although there are different races of people living in Hong Kong, it is less number of this kind of architecture. The racial harmony in Malaysia also impress me very much.

Visiting green buildings is one of the signature part of our study tour, and I have benefited from design and technology of green building. To achieve energy saving, the appearance of green building are usually using large amount of glass to provide the natural lighting. Malaysia is different from Hong Kong, there is no land shortage which they no need to worried about using every space. They have more opportunities to apply more green design features in the building, such as natural ventilation and natural lighting by removing floor slabs to link all floors. These features are hard to see in Hong Kong, and they really broaden my horizon. It is difficult for Hong Kong to implement but I believe Hong Kong engineers have tried their best to achieve green building design. In addition, I finally can see some designs I learn from lesson during the visit, such as cooling slab and ice storage for air conditioning. The visit gave me the practical image but not the virtual concept which I think this is good for my future study.

Another signature part of the study tour is the Chapter Regional Conference (CRC). We can met different professionals related to air-conditioning such as manufacturer, scholar and engineer. It was the first time for me to participate such a large scale conference and this is actually precious experience. I also met students from the other chapters, this conference provides the opportunity and a platform for us to make friends with people who have the same interest or goal in this aspect. I look forward to meet them again or corporate with them in the future. In the last day of CRC, we went to the factory technical visit and I learnt more about manufacturing of air conditioning system.

It was lucky that I didn't miss this study tour as I really get a lot from the tour. Thanks to ASHRAE Hong Kong Chapter, Dr. Sam Hui and many others organize and operate this study tour, I learnt a lot and will apply the knowledge in the future study and career



NG Hong Man, Brian (PolyU)

It was my first time to be Malaysia. This was an unforgettable experience for me. We visited to the Red Mob and the Prime Minister office on the first day, we have understood more about the religion of Malaysia, as well as the history of Malaysia. The Prime Minister Office combined Chinese, Indian and Islamic architecture styles, which represents these three major cultures in Malaysia are equal and integrated.

On the second day, we visited to the famous Chocolate brand factory - Beryl's chocolate factory. It impressed me that Malaysia not only be famous because of Duran, but also chocolate. We brought a lot there. Then, we went to ST Diamond Building, which is a Platinum awarded building. It is energy efficient and sustainable. It has applied Radiant Slab Cooling system, rainwater harvesting system and well designed daylight adoption. The dorm on the roof top allows sufficient daylight to access the whole building. These help the building to have a great performance on Energy Use and Water use. It was impressive that their engineers could design such a thermal comfortable, green and sustainable building, but this kind of latest technologies are still not usually applied in Hong Kong. In this area, Hong Kong still needs to improve.

On the third day, we have been to 2 local universities, which are UTAR and UniKL. During the visit, we had met the Malaysia students as well as the post-graduate students from France in UniKL. We had some cultural exchanges and deep conversations about their research projects. Then, we visited their laboratories and their library. Moreover, we went to the Master of Architecture Graduation Works Exhibition. They built some model to demonstrate their design buildings. Those stunning models were pieces of art. I saw the architecture students were working very hard while we were walking outside the classrooms. After the visit, those friendly and kind Malaysia students took us to the night market. We had some delicious local food there.

On the fourth day, we visited the PAM centre, which is the new centre of the Institute of Architect Malaysia. It applied a large proportion of green wall, and well internal ventilation, which reduce a large amount of energy consumption. It is very comfortable in the atrium even there is not any air-conditioning.

On the fifth day, it was the main event of this study tour, which was the CRC seminar, student forums and competitions. We have learnt a lot of latest technologies in the industry from our fellow sponsors. Furthermore, we met a lot of friends there. Our friends from the Philippines are very enthusiastic and energetic. They were active in the competition. We also had joyful communication with the Taiwan Chapter students and Thailand Chapter students. During the banquet dinner, students from different chapters did their best to finish their performance. I really appreciate their hard work and enjoy their excellent traditional performance.

On the sixth day, we visited to the factory of 2 of our Platinum sponsors. Those are Trunwater and AAF. In Trunwater, we could observe the real cooling tower, learn about the techniques of cooling the chilled water through evaporation and the new AI control cooling tower. In AAF, we learned what is air filter, which is something that I haven't learnt in the lectures. We also had a chance to involve the manufacturing process by our hands. The visits of the two factories are informative and unexpected. It was excited to see a piece of product being produced from zero.

Finally, I would like to give a big thank to ASHRAE Hong Kong Chapter, Malaysia Chapter and CRC committee to organize this awesome tour, which broadens our horizon and provides a platform. for us to meet so many friends around Asia.



LAU Yat Ming, Alan (HKUST)

It was my first time traveled to Malaysia and it was a wonderful study tour. The tour was well-organized and fortunately, we had an experienced tour guide, Ms. Cas. During the whole study tour, she introduced the Malaysian history and culture to us. Since we abled to have conversations with her in Cantonese, all of us could have a deep understanding of Malaysia. For example, the history of Royal Selangor which is a famous Malaysian pewter manufacturer and retailer, and the correct way of tasting the local half-boiled egg. On the first day in Malaysia, we had a cultural visit in Putrajaya which is the administrative capital of Malaysia. The major architectural styles of the buildings in Putrajaya are Chinese, Indian and Islamic. Those buildings are spectacular and attractive to me.

On the second day, we got a chance to visit the ST Diamond Building which is a green administrative building and own many local and international awards. The technical officer introduced the background to us and explained different methods of saving energy. The engineer designed the building in a way that could achieve high energy and water efficiencies, good indoor and outdoor environmental qualities and environmental protection. For instance, they planted grass in the rooftop to reduce the temperature and utilized insulated wall to maintain the indoor temperature. We learned a lot of mechanical engineering knowledge in that visit.

On the third day, we visited two local universities which are UniKL and UTAR. The most exciting part for me was the cultural exchanges with the local students, I was able to know more about their daily lives in universities and Malaysia. I was surprised by their language abilities, most of them were able to have conversations with us in at least four different languages. The advisors of the universities led us to travel around their universities, we had an opportunity to visit their laboratories, canteens and libraries. Since most of us are studying mechanical engineering, I found that we had many things in common such the labs and projects. Ms. Cas also introduced the university policy of the local government, so we could understand why there are many branches of foreign universities in Malaysia.

On the last few days, we had many CRC functions organized by ASHRAE such as the technical seminar and visit, as well as the banquet dinner. I met different students from other chapters, and we had some team building games in the evening of the sixth day. The technical seminar was informative and useful for me because I could gain knowledge from the speakers who are some experienced mechanical engineers. In the team-building part, I established a great bonding with foreign students and even the student from my chapter. During banquet dinner, we had a chance to enjoy the delicious meal and the excellent performances of various chapters. I knew more about their cultures through the performances, for examples, the Philippine students used their traditional musical instruments to perform local music.

All the people I met in the study tour were nice and friendly, they had taken care of us in that week. When we visited the local night market, some Malaysian came with us and bought some local snacks for us. Moreover, some of Hong Kong students and I went to the local club and bar to have a drink with the students from Taiwan and Malaysia chapters in the last two days. We shared our daily lives in three different cities and countries, and all of us became good friends after the tour. In this study tour, I had broadened my horizon and learned a lot from the others.



WONG Wang Sing, Aidan (HKUST)

This trip to Malaysia is a meaningful tour for me. Although I have been to this country before, I never have a chance to meet the people with similar ages. ASHRAE gives a chance for us to communicate with each other with different nation from different countries. In this trip, I meet different kinds of participant in other Chapters and know more about their cultures and differences.

First is the section of the technical seminars. To provide us a basic knowledge about what is going on in this trip and make an introduction, professors show us the basic ideas and developments of the related topics in this few years. Although it may be a bit boring, but many of us are trying to make notes and get to know the newest things.

Due to the many of participant in different Chapters joining the activities, we are separated to four groups in student competition and forum section. The team I am in is the black team. We play several team building games and get to know each other. I think it gives a great chance for me to get out of our own Hong Kong team in this section. As we all know, in a new place with no one else known, we get to communicate with someone we are closer with. For me, they are who else comes from Hong Kong. In this section, as we need to discuss, to plan the best way to win the game, we keep trying to communicate with each other. In this process, I meet friends who came from Taiwan, Singapore and Philippines. We also take some lovely photo afterwards.

It is a bit nervous in the Banquet Dinner section for me at first. As our Chapter has 21 participants, I am the one who are sitting on the third table. The participants near me is all come from the Philippines Chapters and I knew no one of them. Luckily, they are nice and smile at me gratefully. We discuss about what we learn at school, daily life and what is going on in Hong Kong. I was a bit shocked that many people in other countries get to know that much about Hong Kong nowadays. When the Banquet Dinner is going on, we start to have our performances section. I know more about different cultures in performances in different places. It is very nice.

We have been to different places for technical visits in several groups. I went to the Japan Air Filter Malaysia (JAF Malaysia) and YILIDA. One is about the manufacturing process of air filter while the other one is for air conditioning. In this visit, I have learnt different application on Air Filter and the way to prevent higher cost in changing the air filter: Changing the primary filter more often. In the manufacturing process, we look at the repairing and testing process. It separates to two kinds of method, human and machining. Human can have a quicker repairing and testing time while it needs a long time for machining testing. Due to the customer needs, they would do a report by machining. The tour gives a chance for us to meet something that we have never seen before: the real manufacturing process, the relations in human and machine. In the sites of saving energy and improving human lives, we all have different places to learn of.

Lastly, I would like to give a big thanks for the all teachers, professors and helper who organize and pay their efforts on this Malaysia tour. We enjoy this trip so much and have a great memory and relations.

5. CONCLUSION

The Malaysia Study Tour 2019 was an eventful and meaningful trip for many reasons. This trip was the 13th study tour organized by ASHRAE Hong Kong Chapter and it commemorates the history of ASHRAE study tours as Kuala Lumpur was the first destination of this now annual tradition. The trip was filled with joy, unexpected friendships, newfound building knowledges and appreciation for the ASHRAE family. Malaysia greeted our tour group with overwhelming hospitality and supported us through out the trip.

The success of this study tour was the collective effort of ASHRAE Hong Kong Chapter, Malaysia Chapter and the trip's participants. Through teamwork and effective communications, we were able to create unforgettable memories that would be reminisced for the years to come. As a dramatic conclusion to our study tour, our group's return flight home made a detour to Taiwan right before landing due to adverse weather conditions. The journey home was grueling but it reminded us that the sky isn't always blue and the sun doesn't always shine – but with the support of each other, we can always persevere.

We would like to take this opportunity to thank ASHRAE Hong Kong Chapter, THEi Faculty of Science and Technology and the VTC Student Development Foundation for sponsoring our trip.

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Dr. Sam Hui for his selfless organization and execution of the study tour.

Malaysia Chapter and its student branch students for their hospitality.

All the participants of this study tour for their teamwork and cooperation.



APPENDIX:

Selected study tour photos



