



ASHRAE Hong Kong  
Chapter

# Singapore Study Tour

21 - 27 Aug 2017

**Our tour ended.**

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# Forewords

Hong Kong and Singapore are two fast growing economies in Asia. Although broadly similar in historical background and economic structure, the two economies are very different in social, economic and political development patterns. This Singapore Study Tour provided a good opportunity for the Hong Kong students to explore and experience Singapore from different angles.

This is the eleventh year that the ASHRAE Student Branches in Hong Kong organized such a study tour, with the aim to promote student development, cultural exchange and mutual understanding. The study tour has enabled the participants to visit the government facilities, major universities and recent developments in Singapore. Also, they have attended the ASHRAE Region XIII Chapters Regional Conference and interacted with the ASHRAE student representatives and delegates from Indonesia, Malaysia, Philippines, Singapore, Taiwan, Thailand and USA. The study tour allows the Hong Kong students to exchange ideas with peer groups and professionals through the ASHRAE community. The experience will expand their vision in regional and international affairs.

On behalf of the study tour participants, I would like to express sincere thanks to ASHRAE Hong Kong Chapter, ASHRAE Singapore Chapter, the study tour sponsors and all related organizations and people for their kind support. I believe this study tour has created a significant impact to encourage exchanges and cooperation among the students. I hope that the spirit of the study tour will be continued and the participants will extend the findings and experience to benefit themselves, other students and our society.



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

# History of ASHRAE Study Tour

<b>2017</b> Singapore Study Tour	21 - 27 Aug 2017 (Mon-Sun)
<b>2015</b> Philippines Study Tour	17 - 23 Aug 2015 (Mon-Sun)
<b>2014</b> Taiwan Study Tour	10 - 17 Aug 2014 (Sun-Sun)
<b>2013</b> Indonesia Study Tour	26 Aug - 1 Sep 2013 (Mon-Sun)
<b>2012</b> Malaysia Study Tour	9 - 15 Aug 2012 (Thu-Wed)
<b>2011</b> Korea Study Tour	22 - 28 Aug 2011 (Mon-Sun)
<b>2010</b> Singapore Study Tour	23 - 29 Aug 2010 (Mon-Sun)
<b>2009</b> Thailand Study Tour	20 - 26 Aug 2009 (Thu-Wed)
<b>2008</b> Philippines Study Tour	25 - 31 Aug 2008 (Mon-Sun)
<b>2007</b> Taiwan Study Tour	2 - 8 Aug 2007 (Thu-Wed)
<b>2006</b> Malaysia Study Tour	24 - 30 Aug 2006 (Thu-Wed)

# Acknowledgements

Sincere thanks are expressed to the following organizations and persons.

ASHRAE Hong Kong Chapter:

Mr. Michael Sung (Chapter President 2017-18)

Dr. Dennis Tung (Chapter President 2016-17)

Mr. Andy Lo (Student Activities Chair)

Dr. C. S. Wong

ASHRAE Singapore Chapter:

Mr. Patrick Ho (Chapter President 2017-18)

Mr. David EDENBURN (Chapter President-Elect 2017-18)

Mr. LEONG Cheng Wee (CRC Chair)

Mr. Rajesh Pudupadi Balachander (Student Activities Chair)

Professor LAM Khee Poh (NUS)

Professor Chandra SEKHAR (NUS)

Professor Stephen LAU (NUS)

Dr. Jacky Chung (NUS)

Ms. CHAN Yoke Cheng (CUGE, National Parks Board)

Building & Construction Authority (BCA), Singapore

Housing Development Board (HDB), Singapore

Nanyang Technological University (NTU)

National Parks Board (NParks)

National University of Singapore (NUS)

Public Utilities Board (PUB) NEWater Visitor Centre

Singapore Botanic Gardens (SBG)

Urban Redevelopment Authority (URA), Singapore

# Executive Summary

It is our first time to participate in study tour. Total 36 students from 5 different higher education institutes, which are Technological and Higher Education Institute of Hong Kong (THEi), The Hong Kong Polytechnic University (PolyU), The University of Hong Kong (HKU), City University of Hong Kong (CityU), The Hong Kong University of Science and Technology (HKUST), took part in this Singapore study tour from 21st August to 27th August in 2017 summer.

In this seven-day trip, we visited National University of Singapore (NUS) which located in Kent Ridge, southwest of Singapore. NUS is one of the most famous University in Asia with total 16 colleges. Not only acquiring university's background and engineering knowledge, but also can we had precious opportunities to have academic and cultural exchange with students in Singapore through the university's exchange.

Moreover, we went Public Utilities Board (PUB) NEWater Visitor Centre for the technical visit. We appreciated how great efforts that Singapore paid for working on water resources and saving. As demand for water continues to increase in tandem with population and economic growth in Singapore, NEWater, which is treated used water, is a new technology to solve the water issues in Singapore.

Apart from academic visits and exchanges, we also participated in ASHRAE Region XIII 20th Chapters Regional Conference (CRC) on 25-26 August 2017. It gave us a chance to learn more technical knowledge in the seminar. Also, the banquet dinner & student performances gave us a precious opportunity to recognize other ASHRAE Chapters student members, which come from Japan, Taiwan, Singapore, Malaysia, Thailand and Philippines. It is a rare opportunity that we can have academic and cultural exchange to many other countries student in the banquet dinner.

Organizing such a successful study tour is not easy. We would like to take this chance to show our profound thanks to ASHRAE Hong Kong Chapter for supporting student's education and activities.

Thanks Dr. Sam Hui for his selfless assistance and continuous guidance to youngsters. Thanks Prof. Moses Ng, Dr. Constance Luo, Dr. Ernest Tsang and Ms. Sanny Chow for taking good care of all of us in the tour. Thanks our dearest tour-mates for their valuable contribution to this wonderful tour.

Mr. Kwok Tsz Yin, Jack (THEi)  
Mr. Ching Man Kit, Marco (THEi)  
Mr. So Ka Him, Ernest (THEi)

# Introduction

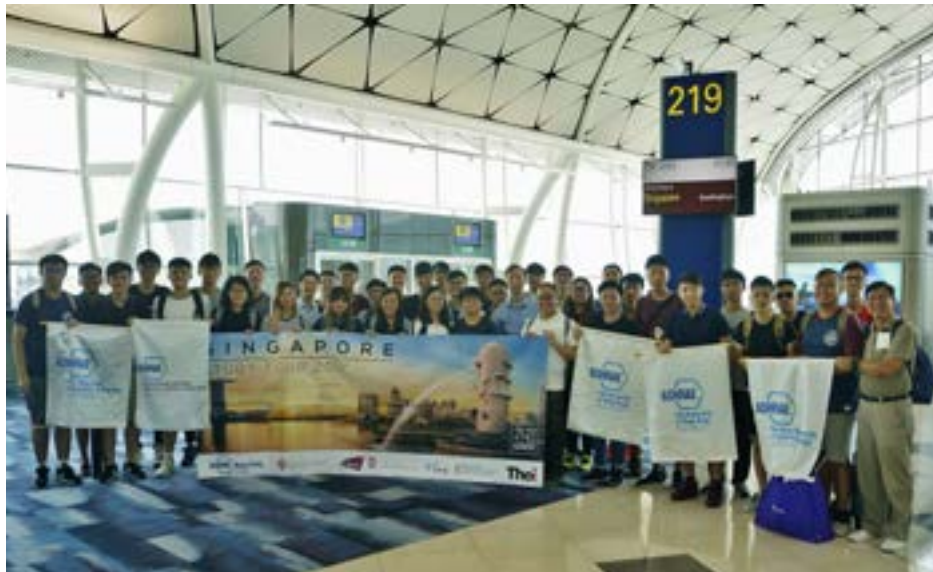
## Background

In August 2017, the ASHRAE Region XIII 20th Chapters Regional Conference was held in Singapore. The study tour to Singapore was arranged to allow the students in Hong Kong to carry out technical and academic visits and culture exchanges.

## Objectives

The objectives of this study tour are:

- To study the building and engineering technologies in Singapore
- 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



# Introduction

The participants of the study tour come from 5 student branches including City University of Hong Kong, The University of Hong Kong, The Hong Kong Polytechnic University, The Hong Kong University of Science and Technology, and Technological and Higher Institute of Hong Kong. Before having the study tour, students had to attend meetings for the preparation works. Through the meetings, students from different institutions learnt the importance of teamwork, organisation skills, and made new friends or extended personal network. During the study tours, attending professional engineering conference, technical visits, company visits and sightseeing had broadened student's horizon and personal network. In addition, students were able to meet different engineering students from the Philippines, Taiwan, Thailand, Indonesia, Singapore and Malaysia. Cultural values could be exchanged with different student chapters and a better understanding of Asian countries would be developed.



# Tour Itinerary

## 21 Aug 2017 (Monday)

**AM** Depart Hong Kong T2 to Singapore T2  
TR2063 1055-1455

## 22 Aug 2017 (Tuesday)

**AM** Urban Redevelopment Authority (URA)  
Centre's Singapore City Gallery

**PM** Academic Visit to National  
University of Singapore (NUS)

**Evening** Visit Enabling Village

## 23 Aug 2017 (Wednesday)

**AM** Singapore Botanic Gardens

**PM** Housing & Development Board (HDB)  
Gallery (Housing) and Showflats

## 24 Aug 2017 (Thursday)

**AM** Public Utilities Board (PUB)  
NEWater Visitor Centre

**PM** National Museum of Singapore (NMS)

# Tour Itinerary

## 25 Aug 2017 (Friday)

**AM** CRC Technical Seminar at Hilton Hotel

**PM** CRC Technical Tour :  
Building and Construction Authority (BCA)  
Gallery & BCA Skylab

or

Energy Research Institute @NTU (ERIAN)

**Evening** CRC Banquet Dinner

## 26 Aug 2017 (Saturday)

**AM** CRC Technical Tour :  
Energy Efficient Chiller Plant Visit

**PM** Visit Gardens by the Bay  
--Sustainability & Fun Tour

## 27 Aug 2017 (Sunday)

**PM** Depart Singapore T2 to Hong Kong T2  
TR2068 1655-2100



## Tour Experiences

### Urban Redevelopment Authority (URA) Centre's Singapore City Gallery

In Singapore, there are the building of urban redevelopment authority and the only gallery that tells the story of the nation's planning efforts, showing its remarkable physical transformation. This gallery has 10 thematic areas and more than 50 audiovisual and interactive exhibits spanning. It offers me an exciting, multi-sensory learning experience into Singapore's planning journey. It also has one of the world's largest architectural models that showing an exclusive bird's eye view of Singapore's central area and government future planning.

The urban redevelopment authority also aims to protect some old building and refurbishment. Before work started, the student of the NUS Department of Architecture under Associate Professor Chan Yew Lih that carried out a through documentation of the house. They recorded all the original architectural and artistic features that were still intact. It was an important base-line survey to guide restoration. For instance, the main priority in the project of No.157 Neil Road is to retain the physical integrity and original spatial qualities of the house. Hence, the original uses of each of the rooms have been retained so as to reuse the existing structural system, material and layout. So the pre-condition survey is really important to understand every detail of the old building and design the refurbishment planning. After the test of construction materials and the simulation by the computer software, the refurbishment will start and ensure different elements of the house were restored to different levels that balancing out the need for authenticity, retention of all undamaged materials while restoring visual and design coherence.



## Academic Visit to National University of Singapore (NUS)

The legend of National University of Singapore(NUS) began back to 104 before. In 1904, the first medical school in Singapore was established by a group of Chinese and non-European. In 1912, the medical school changed its name to King Edward King VII Medical School. In 1949, the University of Malaya was formed by merging Raffles College and King Edward King VII Medical School. Four years before Singapore went independence, the University of Malaya has assigned the satellite campus in Singapore called the University of Singapore, which was also the initial model of NUS. In 80's, the two universities, University of Singapore and Nanyang University (formed in 1955 by a group of Chinese, providing Chinese higher education) merged into one and called National University of Singapore. Starting from the 80's, NUS started its journey to accomplish the top-notch university in the Asia.

Nowadays, National University of Singapore is one of the renowned university in the world. In 2017, the QS ranked NUS as the best university in Asia region. NUS is the most historic autonomous government-funded university across Singapore, cultivating genius and industrial professionals for Singapore and Asia. Over the decades, a rapid development turns NUS to become a mature university, having 16 faculties and schools across the three main campus, Kent Ridge, Bukit Timah and Outram.



Upon 22th August 2017, we visited The School of Design and Environment(SDE) and have given a talk by Dr. Chung Kin Hung Jacky (the associate professor of Department of Building, SDE). Dr. Chung briefly introduced the programs that offered by their department for undergraduate and postgraduate students. Also, he brought in the idea of BIM that NUS had been recently paying tremendous effort in.



Besides, we visited the NUS's University Town (U Town). U-Town is a concept of engaging the residential space, education hub, teaching facilities and study clusters into one campus complex. U Town has applied a plenty of greening and eco-friendly elements to enhance the environment and students' lives.





## Singapore Botanic Gardens

Singapore Botanic Gardens (SBG) was established in 1859 by the Agri-Horticultural Society and designed by Lawrence Niven. In the early years, the Gardens played a key role in fostering agricultural development in Singapore. They through collecting, growing, experimenting and distributing to find potentially useful plants. SBG continues improving and makes Singapore becomes a Garden City. In 2015, SBG was honored as a UNESCO World Heritage Site and there is the only one having this nomination in Singapore.

During the time visit at SBG, we can know more about forest and plants. There is a freshwater swamp call "The Learning Forest" which is an extension of the SBG. As time goes by, the forest turn into mature, more organism and is expected to inhabit from this area. Also, "The Swan Lake" is another major attraction in the garden. It was built in 1866 and it is considered to be the oldest ornamental water view in Singapore. The lake named because there are so many beautiful swans that glide across the lake.



Besides, there are more than 3000 kinds of plants. The most distinctive plants in SBG is Orchid flower, which is national flower of Singapore. The meaning of this flower is excellent splendid, million generation of immortal. It has a strong vitality and can be passed down from generation to generation. In November 2015, Singapore use the name of China's chairman Xi Jinping and his wife to name the new varieties of Orchid flower, want to indicates that the friendship between the two peoples of the varied often keep it on. Moreover, Cerbera is the first you can see in the garden. Cerbera is a genus of small trees known in the region as Pong Pong or Buta Buta. They having beautiful flowers and green fruitage with size and shape like a mango, but the fruit is not suitable to eat because poisonous.



Furthermore, trees are another point for visit too. In nature, fruits are important in different aspect. They had collected fruit trees features over 50 species of wild fruit trees from Singapore and around the region. On the other side, there is a Tembusu which reported more than 150 years old, has a girth spanning more than 7.8 meters in circumference and stands at a height of 30 meters. The Heritage Tembusu was printed at the back of the Singapore \$5 note.

Finally, some of the animals are stay or live here, such as kingfishers, wetland bird, reptiles, forest birds and butterflies. SBG provided a suitable area which can attract animals to come here. You may see some animals that not easily find in daily.



## Housing and Development Board (HDB) Gallery (Housing) and Showflats

In 23 Aug 2017, we went Housing & Development Board (HDB) Gallery to discover Singapore's public housing. There were 6 zones to tell public housing Story in the following order: Entrance Foyer, Our reflection, Our Home, Our Heartlands, Our Aspirations, Our Future. In zone 3, there was a 360° panoramic theatre for an immersive experience of our residents' lifestyles and show 'home' capturing the life experiences of many Singaporeans who grew up in our public housing estates. In zone 4, we could know more about the strategies in providing quality homes, cohesive communities, and vibrant towns for our residents, such as Home ownership is the cornerstone of Singapore's public housing programme, Town planning, Town Discovery Challenge, Town Navigator. In Zone 5, it was about everyone can contribute towards a better living environment and include sustainability and green living features which understand how the sustainability initiatives in public housing. In Zone 6, it is about exciting plan drawn up to constantly keep pace with the needs of the ever-changing community, such as Remaking the heartland, dreamscape, futures cape and excellence in public housing.



### Zone 4: Our Heartlands

In Zone 4, there are some information about public rental scheme. HDB has built close to 900000 flats and most of flats are owned by the residents, about 50000 are for rent under the public rental scheme which mainly cater for unable to afford homeownership flats, no any family support, no other housing options. Therefore, housing assistance provide to such household through heavily subsidized public rental scheme. With below \$800 a month, they can pay monthly rent \$26-\$33 for 1 room flat and \$44-\$75 for 2 room flat. Apart from this, Singapore also care people living standard and implement some improvement programme, such as home improvement programme (HIP) that address common maintenance problem. It consists of optional improvement such as toilet upgrading and essential improvements, such as repairing spalling concrete ceiling leaks and replacing waste pipes. Moreover, neighborhood renewal programme focuses on block and neighborhood improvements. Its key feature of NRP is the active engagement of residents through consultative public forums.



### Zone 5: Our Aspirations

In Zone 5, there were some innovations in sustainable development: Greening the Estates, Harvesting Rainwater, Promoting Recycling, Saving Energy. Actually, we can see many green build inside the building because of the award-winning Prefabricated Extensive Green (PEG) tray system that allows instant greenery on roof decks of residential blocks and multi-storey carparks. Vertical greening system are also explored to further enhance skyrise greening in their estates. Apart from this, storm water harvesting is a water-saving feature that captures rainwater and reuses it for irrigation and washing of common areas. Moreover, Singapore promote a centralized recyclable chute system makes disposing of recyclables more convenient for heartlanders. Chute openings are located on every floor to promote recycling in HDB estates. Also, Singapore encourage the energy save programme 'modernised' estates with energy efficient solutions such as motion sensor lighting, such as LED-lit common areas and solar panel. The goal is to reduce by as much as 40%.



### Public Utilities Board (PUB) NEWater Visitor Centre

A part of our study tour is visiting the Public Utilities Board (PUB) NEWater Visitor Center, which exhibits an amazing "invention" in Singapore – NEWater. The occurrence of NEWater was to alleviate the immediate water shortage in Singapore in the early 2000s. Currently, Newater becomes an alternative water source in Singapore and at least 500 thousand cubic meters of NEWaters are produced in one day in order to solve the fresh water demand.



Before the Newater is successfully produced, there are three main process of purification and filtration. The sequences are microfiltration, reverse osmosis and ultraviolet disinfection. Microfiltration is to filter the fine particles dissolved in the treated water . Reverse osmosis is to use the semi-permeable membranes to filter out other undesirable contaminants such as bacteria, viruses, heavy metals, and the most dissolved salts. Due to a few concentration of salt, NEWater becomes "tasteless" and that is the reason NEWater is regarded "abnormal water".



### National Museum of Singapore (NMS)

It locates at the central of Singapore and is the most historical museum in Singapore. There are two theme pavilions which are SINGAPORE HISTORY GALLERY and LIFE IN SINGAPORE. They can not only let us to understand the history and culture of Singapore but also Singapore's daily life of the various styles. Also, the Architectural style of building is beautiful and Magnificent. It uses European architectural style such as Round roof and Roman column.

#### Singapore History Gallery

First, we entered the Historical pavilion. There are many audio and video devices provided for the visitors such as headsets and Display screen. So, they can easily make us know the history and culture of Singapore. The Singapore History Gallery's updated narrative charts the development of the island as it was known the years as Singapura, a Crown Colony, Syonan-To, and finally, Singapore. This gallery chronicles Singapore's journey from the earliest beginnings 700 years ago to the colonial days, to the Japanese Occupation and post-war struggles, and to the global city today.



## Life in Singapore: The past 100 years

In this gallery, we can know the culture of Singapore's last century's diet, clothing and have a social life review. Spanning the last 100 years, these four galleries present snapshots of everyday life through the different eras in Singapore's history. It records how modern and progressive people were during the colonial times in the 1920s – 1930s in the Modern Colony gallery. Gain a deeper appreciation for the resourcefulness and resilience of those who found hope and love in the Surviving Syonan gallery, which looks at the years of the Japanese Occupation. See the 1950 – 1960s through the eyes of a child growing up alongside the nation in the Growing Up gallery, which captures the dreams and aspirations of a generation. Self-experience and creative take the front seat in Voices of Singapore, which explores how a new, confident, Singaporean identity emerged in the 1970-1980s.



## Glass Rotunda: Story of the Forest and Singapore, Very old tree

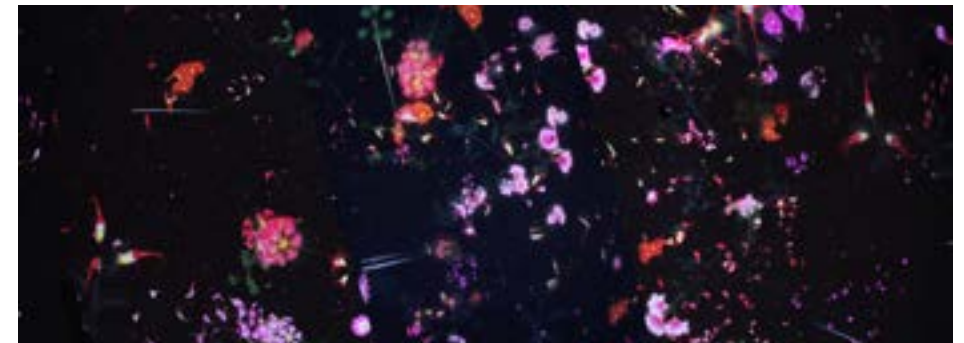
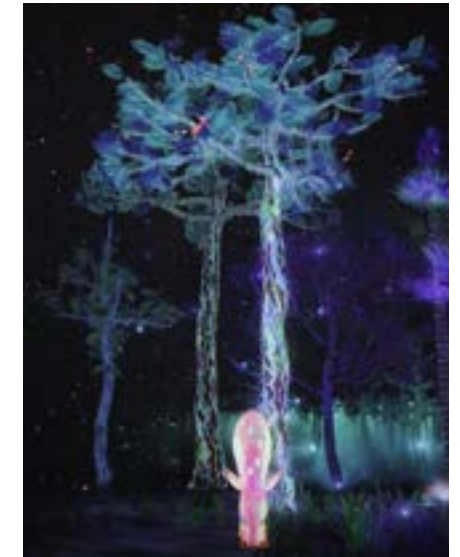
The National Museum of Singapore's Glass Rotunda the new art installations which offers visitors a visual enjoyment.

The first installation is a commissioned work titled Story of the Forest, a larger-than-life interactive digital art installation created by internationally renowned Japanese art collective teamLab. The installation refers to the William Farquhar Collection of Neural History Drawings, and utilizes cutting-edge technology to transform 69 drawings from the collection into animated illustrations, which will come to life and interact with visitors as they make their way down the Glass Rotunda.

At the end of the multimedia journey, we could view a photography exhibit called Singapore, Very Old Tree by some Singapore artist that explores the personal connections that Singaporeans have with their local trees through 17 images of trees around Singapore.

## Art gallery

The Art gallery presents a lot of local artist's art works and records the development of local art culture such as ART OF REHEARSAL and WINGS OF A RICH MANOEUVRE. Art of Rehearsal records Singaporean dancers across various cultures practicing along the back lanes of cultural district in the city through videos.



## CRC Technical Seminar at Hilton Hotel

This year the ASHRAE Region XIII Chapters Regional Conference was successfully hosted by Singapore Chapter between August 25th and 26th.

The theme of the technical seminars this year is. Three honorable speakers were invited to conduct a seminar for us respectively and they are:

1. Mr. Gordon Sharp, Aircuity
2. Mr. Francis Tay, Principal Manager of Green Mark Department (Existing Buildings)
3. Mr. Vincent Low, Vice President, G-Energy Global PTE Ltd

### Seminar 1 (By Mr. Gordon Sharp)

The main theme of this seminar is how to make laboratories and commercial buildings smarter in order to maintain their energy efficiency entitlement. There are five sub-topics of his speech:

1. Discuss issues involved in saving lab energy
2. Review Demand Based Control concept
3. Discuss the Energy Saving/O&M Cycle & Issues
4. Describe intelligent building analysis for labs
5. Provide examples of intelligent agent analysis
6. Cover commercial building applications

Mr. Sharp started his speech by introducing some examples of building energy efficiency entitlement projects he completed before included Masdar City in UAE, Grand Mosque in Mecca, the MGM Macau Hotel and so on. Then he discussed how to dramatically reduce the energy use of labs such as reducing the outside air since it is the largest energy driver. He concluded that even a net zero lab is possible if all those approaches could be used. The concept of demand based control of air change per hour (ACH) was explained which we could refer to 2015 ASHRAE Handbook for guidance as suggested by Mr. Sharp. After that he discussed the O&M Cycle & Issues and introduced examples in the US and Singapore to support his arguments. This seminar has provided us a glimpse of the latest building energy saving techniques.

### Seminar 2 (By Mr. Francis Tay)

The main theme is piloting a new paradigm for continuous commissioning of chiller plant. Mr. Tay first introduced Singapore's Green Building Master Plan and the current green marking in Singapore and overseas. He elaborated multiple approaches to green building including passive strategies which should be implemented as a first priority, active systems with high efficiency to support or supplement the passive measures and also renewable systems. Then he explained how the use of BCA smart chiller portal can help enhancing the efficiency of chiller's energy consumption and its benefits to buildings.



### Seminar 3 (By Mr. Vincent Low)

The third and the last seminar was conducted by the Vice President of G-Energy Global Mr. Low. The topic is about whether Green Building Certification enhanced our air-conditioning performance and energy sustainability. Mr. Low began his speech by introducing some basic concepts in green buildings such as:

1. Green building is just quality design, construction and maintenance
2. It is not something odd or unusual like many of the publicized rarities (straw bale, rammed earth, composting toilets, grey water, etc.)
3. It is about educating professionals to do a better job
4. Green buildings is about educating consumers about what they are buying and teaching them to understand that they have choices
5. Green Building can be done at every budget level

He also discussed some case studies on how to optimize air-conditioning design to achieve green building award and energy sustainability by installing energy saving air-conditioning equipment. He also hoped that by promoting the green building certification, a culture that is fully committed to clean and green environment can be created for future generations through promoting energy conservation.



## CRC Technical Tour: Building and Construction Authority (BCA) Gallary & BCA Skylab



The Building and Construction Authority (BCA) is an agency under the Ministry of National Development, championing the development of an excellent built environment for Singapore. "Built environment" refers to buildings, structures and infrastructure in our surroundings that provide the setting for the community's activities. The gallery is divided into a two-storey exhibition that consisting of six zones. Each zone comes with distinct themes and interactive exhibits to educate the public on the importance of the building and construction industry in shaping the present and future development of Singapore.

There are four key pillars of a future-ready built environment - namely, safety, quality, sustainability and friendly - are highlighted collectively in this multi-sensory treat of interactive exhibits, model showcases and pull-out panels. We look forward to an interactive journey to see how Singapore's Built Environment has transformed over the years and understand how important aspects are integrated into the development of Singapore's Built Environment.

Then, we went to the BCA SkyLab which is a state-of-the-art rotatable test facility pivotal to developing innovative energy efficient building technologies. The facility is modelled after the Lawrence Berkeley National Laboratory's FLEXLAB (Facility for Low Energy Experiments in Buildings).

A unique feature of the test facility is its rotatable platform system. This allows the study of the performance of building systems, building energy use and indoor environmental parameters change in a variety of orientations relative to the sun. Such studies are potentially useful for studies in cooling, lighting and shading strategies. The BCA SkyLab will be located on the roof top to avoid being blocked by neighbouring buildings. It can engage the industry and researchers, a dedicated lounge and demonstration space is set up for sharing of knowledge, and to demonstrate the performance of technologies tested.

The Nanyang Technological University (NTU) is an autonomous university in Singapore. We had gone around the campus and visited the engineering training workshop. The campus seems to be more open area than Hong Kong's University. It was a fruitful and enlightening visit to NTU.



# Day 5 25 Aug 2017 (Fri) Evening

## CRC Banquet Dinner

The ASHARE Region XIII CRC Banquet dinner, which is joint by various Ashare Students Chapters, like Hong Kong, Indonesia, Japan, Macau, Malaysia, Taiwan, Philippines, Thailand, Singapore and South Korea was successfully held on 25 Aug 2017 (Fri) evening at one of the famous Hotel, which is called Singapore Hilton Hotel.

There are nearly 80 Philippines students, which has the largest number of participants, joint this wonderful events. Meanwhile, about 40 Hong Kong students, which comes from different university, like HKU,UST,POLYU,CITYU and Thei participated. During this meaning events, there are various activities which include traditional dancing performance, group singing show and award presentation. It provides great chances for committee members exploring overseas culture and communicate with students which comes from other Asian countries.

During the music shows, Thei students, which is nearly 40 students sing several popular songs on stages. It includes Mandarin songs 情非得已, English songs Let Her Go and Cantonese songs 喝采. Several talented students, which makes use of other musical instruments, like guitar and piano solo the popular songs 情非得已. Meanwhile, other students, who wear attracted facial masks, funny faked hairs and special designed clothes perform the musical beats by capping hands. It further enhances the live atmosphere which capture the attention of audiences. Some follow the beats and sing together whereas some takes photos with funny performers. It brings a lot joyful and happiness towards all students, teachers and helpers.



Moreover, it provides chances for students exploring overseas culture. For instances, Hong Kong students start chatting and communicate with foreign participants, like asking them whether they would join exchange programmes which are provided by Hong Kong university, introducing the delicious local food and famous restaurants and also capture funny group photos. Besides, in order to keep contact in future, some participants exchange email address, facebook and instalgram title. Some even desire to take part in next year ASHARE Banquet dinner which is held in Hong Kong and also go sightseeing in this amazing city. They sincerely hope to meet again and become everlasting friends.

Apart from it, it is pleasure to enjoy the awesome dinner. For example, 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, like Coca Cola, orange Juice, grape juice and Tiger beer. It is cheerful to drink specialized beers in this happy moment. Even though some students and teachers face turn immediately, they continue drink beers due to their happiness. Also, it is honour for all committee member enjoying fascinated local food since Singapore is known as the World's Food Fair. It provides a wide variety of food choice which include Western and Chinese food. All participants feel joyful when tasting the yummy food. Besides, we should say thankyou to Singapore Ashare members, organizers of this meaningful Banquet dinner and students helpers who assists this wonderful events.



### CRC Technical Tour: Energy Efficient Chiller Plant Visit

Kaer, an air-conditioning company, provides the latest services on the supervising and managing the air-conditioning system for the customers' buildings. Through Kaer Air, customers can enjoy a higher performance and more reliable MVAC systems.

In Traditional, Building owner will own the building meanwhile including the MVAC system. However, Kaer Air means that the MVAC system is separate from the ownership of the building. That means, the building owner only have to pay a fixed \$/RTH fee, Kaer will responsible for the owning and the operating of the air-conditioning system.

To provide a reliably and efficiently MVAC system to the customers, Kaer utilize the technology of K-RealTime. K-RealTime is a technology which the data will directly and instantaneously store on the cloud service, then reflect the information of the system to the K-RealTime Boardcast Centre. Then, the K-RealTime Boardcast Centre will analysis the data and see whether any unusual situations. If the system notice that there are some abnormal situation, the Artificial intelligence & Machine Learning Software will diagnose the data and give out the relation action.



This service not only can lower the burden of the owners, as the air-conditioning system can supervise and manage by typical experts. Moreover, the K-RealTime technology can instantaneously transmit the situation of the system to the Centre can undergo a better management of the system. If there are any problems, engineers of the Kaer can also diagnose and take action as soon as possible.

### Visit Garden by the bay Sustainability & Fun Tour

Gardens by the Bay is a national garden and premier horticultural attraction for local and international visitors. Also, it is a showpiece of horticulture and garden artistry that presents the plant kingdom in a whole new way, entertaining while educating visitors.

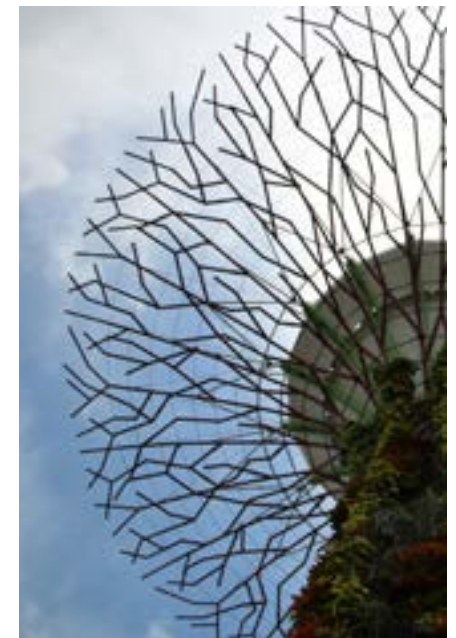
Gardens by the Bay comprises three distinctive waterfront gardens – Bay South, Bay East and Bay Central.



Bay South, the largest of the three gardens, opened in 2012. With its award-winning cooled conservatories and iconic Supertrees, Bay South has placed Singapore squarely on the international map and is a source of national pride.

Bay East, the second largest, offers a tranquil respite from the bustling city and a stunning view of the Singapore skyline even as it unfolds over the next century.

Bay Central is the garden which will serve as a link between Bay South to Bay East when developed, with a 3km waterfront promenade boasting stunning views of the city





In the study tour, it focuses on the the Bay South of the Gardens by the Bay. There are three main attractions in the Garden by the bay, which are flower dome, cloud forest and supertree grove.

#### Flower Dome

Inside the dome, it replicates a mild, dry climate and features plants found in the Mediterranean and other semi-arid tropical regions (e.g. parts of Australia, South America, South Africa). It features seven different "gardens" as well as an olive grove with a bistro and a central changing display field has also been incorporated to enable flower shows and displays to be held within the conservatory.



#### Cloud Forest

It replicates the cool moist conditions found in tropical mountain regions between 1,000 metres (3,300 ft) and 3,000 metres (9,800 ft) above sea level, found in South-East Asia, Middle- and South America. It provides an opportunity to visitors to learn about the location, characteristics, unique species and specific life forms of cloud forests around the world.



#### Supertree Grove

Supertrees are tree-like structures that dominate the Gardens' landscape with heights that range between 25 metres (82 ft) and 50 metres (160 ft). They are vertical gardens that perform a multitude of functions, which include planting, shading and working as environmental engines for the gardens.

At night, the Supertrees come alive with a light and music show and it is a wonderful view for visitor to capture.



## Reflections



### Mr. Chan Hei Nam, Roy (THEi)

I feel very exciting before the trip as I haven't been to Singapore. My Parent told me that it is a place same with Hong Kong. It make me look forward to this tour.

We have a lot of briefing before the trip, I have been ordered to perform on the stage during seminar, which made me feel so nervous that I may not perform well for only one month preparation. However, my teammate Eddie and Jerry encourage me that it would be an unforgettable experience. So I have repeatedly training myself.

The first day at the airport we faced delay problem which make a lot of students feel tired, however, we have a very yummy dinner at Dai Pai Dong, making us looking forward to try more yummy Singapore local foodies.

For the second, third and fourth day we have visited a lot of interesting place in Singapore. As I have do a lot of research on Singapore history, because I can increase the incentive of knowing this place and be ease to know the change, I think Hong Kong need to learn more from Singapore. For example the citizen in Singapore is easy to buy are room but Hong Kong is extremely difficult, also the size of flat is fit for the required number of people.

The fifth day is the technical seminar, is a most nervous day owing to the show. Before the show, I knew a friend call Jun from Japan Chapter and I prepare are old Japanese song which I have tried before and sing with him. It is my first time show and also partner with other singer. Although our performance is not good enough cause of our nervous, I find that singing is very exciting especially cooperate with my friend, and we have successfully bring up the mood of audience. It is a real unforgettable experience for us.

Also at the seminar, not only Japan Chapter, I also knew some friends from Taiwan Chapter, Phillipies Chapter and Singapore Chapter, which make me to know more friend and I can also train my communication skills.

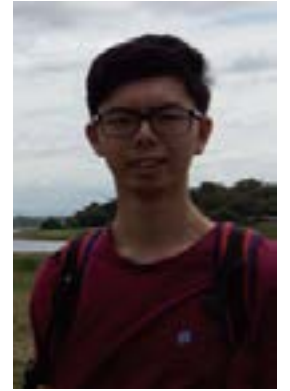
I think this trip is very meaningful. Not only for my knowledge on BSE, also learnt the culture of other country. I hope that I can join it next year.

### Mr. Chan Tak Hei, Tak (THEi)

In the late of August 2017, I have joined ASHRAE Study tour to Singapore. It is the first time to Singapore, it was a memorable trip to me. People always said "Singapore is similar to Hong Kong.", after the tour I found something different and there are several things we should learn from them.

Singapore and Hong Kong are facing some social problems, e.g. the housing problem, the lack of lands, the water resources etc. But Singaporeans have used the innovative methods to solve these problems. The Public Utilities Board (PUB) NEWater Visitor Centre is most impressed to me. Singapore authorities was collected the waste water to reuse. When I first hear this action, I think it is a ridiculous. How can be reuse the waste water. After the guide tour, I think it is really possible to apply the technology in Hong Kong. PUB collected the waste water and do some water treatment, the water can be use again as the industrial usage. Although the water is mostly industrial usage, it also satisfied with the World Health Organization (WHO) Standard for Drinkable Water. This technology is advanced and really suitable for the city/country who is facing lack of water resources.

Last but not least, thank you ASHRAE Hong Kong Chapter offering me an opportunity to visit Singapore and join this meaningful seminar, site visiting and have chance to meet new friends who came from different countries. Also, thank you ASHRAE Singapore chapter for the enthusiasm welcoming. I look forward different chapters to have CRC activities in Hong Kong next year.





### Mr. Chan Tsz Hin, Hin (THEi)

It is the most impressive week-tour in Singapore. Through this study tour, I have a chance to understand why Singapore can be one of the greenest countries in Asia and even in the world. I think Hong Kong should follow how Singapore have done in certain areas to gain the name of 'green country'. I have learned how sewage can be treated to drinkable by visiting Public Utilities Board (PUB) NEWater Visitor Center. As the water in Singapore is bought from Malaysia like Hong Kong buying water from China. There are lots constrains in using water. Singapore has to renew their water to become more self-sustainable. The quality of NEWater has exceeded the stand from World Health Organization and Centers for Disease Control and Prevention. Still, they are keep improving the quality. There are 2.8 million m<sup>3</sup> of sewage discharging to the sea. If we can do what Singapore have done, we may reduce the amount of water purchased from China and become more environmental friendly.

After visiting and talking with the CEO of Kaer, I totally agree with their concept. If using water and electricity can be charged why air-conditioning cannot? Out sourcing the air-conditioning service to a team of engineers not only can maintain the efficiency of the chiller plants and may also reduce the time of using air-con. It is a very fresh idea to me and a key to reduce energy usage.

Although I was amazed by how Housing and Development Board (HDB) designs a block of HDB flats into a small Singapore as the ratio of ethnicity of HDB flat owners is carefully calculated, I am concerning about the ethnic minority in Singapore. They may feel lonely or helpless when they are in need as they cannot live in a same building with larger amount of number.

To conclude, it is an unforgettable study tour I have ever participated. Thanks to ASHRAE giving this opportunity to me. Things that I experienced and leant are way more than I expected.

### Mr. Chen Si Tong, Brian (THEi)

In this summer, the Singapore study tour is unforgettable in my life since I learned so much during it. It can not only enhance my English speaking, improve the communication skills but also expand my horizons, knowing the culture of Singapore.

First of all, in day 2 morning, we have a visit to the Urban Redevelopment Authority Centre's Singapore Gallery. In this visit, we have learned the urban design idea in Singapore. We knowed about the art and science of creating memorable buildings and streetscapes that help make Singapore more distinctive from the guide in the gallery. Also, we also get the idea of the sustainability planning in Singapore. We have discovered how land is planned for live, work and play opportunities, creating an endearing home for all. The knowledge learned in this visit can be very useful in our future career in designing the building services systems. Moreover, the visit still has the conversation with the stakeholders of the city plan. We have learned that it is not just city planners who shaped Singapore's physical landscape but everyone has a role to play. We have met and listened to the different stakeholders to see how they can all make a difference in realising their city design plans.

Besides, in day 4 morning visit to the Public Utilities Board NEWater Visitor Center, we have knowed that Singapore has a better conservation of water resource than Hong Kong. Nowadays, there is more and more demand for the potable water in the world. After the visit, we have learned that as matter as fact, Singapore has been recycling the used water into fresh water since the 1950s. Being treated in microfiltration, the used water is reversed to osmosis and ultraviolet disinfection. Nowadays, in fact, the NEWater plant supplies Singapore 45% of the total fresh water for the daily uses of all the Singapore citizens, including all the swimming pools in Singapore. After the Singapore study tour, I think the Hong Kong Government can put more money onto this kind of technologies since Hong Kong is too relying on the Dongjiang water supply. If Hong Kong can use this technology, we can improve the monotonous water supply.

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





### Ms. Cheung Sze Wan, Swan (THEi)

Singapore is a well-developed country with a highly developed economy and technological and infrastructural advancement. It enjoys one of the world's highest standards of living. I am pleasure to join this study tour to Singapore exploring the high technology and visiting the authorities building such as Housing & Development Bored.

In this tour, visiting New Water Visitor Centre impressed me most as NEWater can meet up to 30% of Singapore's current needs. It reclaim and purifier wastewater by using microfiltration, reverse osmosis and ultraviolet technologies. The interactive tours show us the NEWater Factory and discover the membrane and ultraviolet technologies that make NEWater so clean. I believe these technologies can be referenced to Hong Kong in the near future to obtain a conventional water treatment processes.

Besides, Singapore is also a city that tree canopy coverage is about 30% which place the top in the Green View Index. It's lucky that we have the chance to visit Botanic Gardens and Gardens by the Bay. From the tour of Botanic Gardens, guide told us that there are more than 1000 types of plants and trees. Many of plants are moved from other countries to see whether the plants can adapt or not. Therefore, tourists can learn most of plants in this Gardens. Also, I appreciate the Gardens that it made the country more natural atmosphere. Government get a well planning for country when they design the use of space and get a good balance between green city, animals and human.

Besides the Green area, housing problem also have been solved by the government. More than 80% of housing are under by HDB (Housing & Development Board). It's surprised that the public housing in Singapore are much larger than Hong Kong. This provide a more comfort living area for Singapore citizens.

To sum up, thank you school and ASHREA for providing this chance for us to Singapore.

### Mr. Ching Man Kit, Marco (THEi)

It was an amazing study tour.

In this trip, I visited many places and hotspots. Most of them were beautiful and attractive. For example, I found garden by the bay was extremely eye-catching. I took lots of beautiful pictures and felt enjoyable when I was visiting. Moreover, I visited National Museum of Singapore (NMS) and Housing & Development Board (HDB) Gallery (housing) and show flats that I could know more about Singapore history and the housing development.

Not only could I widen my horizons, but also offered me a chance to make some new friends who came from different chapters. My schoolmates and I performed a show during the banquet dinner, all of us enjoyed the show very much and I appreciated the other team's performance also. They showed confidence and enjoyment during their performance. Also, we talked to the other students who came from other chapters. It was an unforgettable experience for me!

It is grateful and honorable for me to participate this study tour. I would like to say thank you to my teachers and schoolmates. They made every effort to support and organize the trip and take care of me so much during the past one week.

I love Singapore after this tour and I will visit Singapore again in the future. Thank you.





### Ms. Chiu Wing Kei, Winki (THEi)

I am glad that I got this opportunity to Singapore study tour. As a member of ASHRAE, I have bordered my horizon in visiting Singapore national museum, NUS, and the seminar about the updates information of my future career.

Singapore is similarly to Hong Kong in terms of food, environment and traffic. Singapore has a special traffic arrangement ERP system, which I think Hong Kong can apply to solve most traffic problems.

Also, Singapore is quite international, I learn different culture through the habit and life style.

Especially in the NUS zero carbon building, is interesting to see what we learn in real building. The building applied passive design like day light, solar energy panel etc. And I found it fun to visit the rooftop lab.

### Mr. Hu Fu Keung (THEi)

This trip to Singapore is particularly rewarding for me personally. This is the first time I have come to this country, a country like Hong Kong that was once a British colony. Before going to Singapore, I thought that everything in this country would be similar to that of Hong Kong. Because the country has a very similar historical background to Hong Kong, for example, the Chinese population accounts for the majority of the country's population and it has experienced the aggression of the Second World War and Japan occupation. Moreover, it is also a coastal area. However, they still have a lot of different and worthy of our study of the place.

After visiting the Singapore Urban Redevelopment Authority (URA) Centre's Singapore City Gallery, I have known that Hong Kong's land area is 1.6 times the area of Singapore's land and it has a population of more than five million. However, its land is all of flat terrain. In the planning of the city, they focus on the harmonious relationship between nature and man. For example, they focus on the conservation of trees and flowers, the height of the building is not so high in Hong Kong, so we can always see the blue sky. There is also a sufficient distance between the building and the building for ventilation and planting of trees, and the building can get enough sunshine to save energy for lighting. Moreover, in the future, the new development zone will be set up an artificial river. Each building has its own different design, shape and characteristics.

Another difference is the water shortage, unlike Hong Kong can buy fresh water in mainland China. So they need to be self-sufficient. In this case they have developed a set of sewage treatment systems and technologies that can turn the living sewage into a drinking or industrial water. To saving water, the city's water taps are replaced by water-saving taps.

In terms of saving energy, their technology and innovation are in front of Hong Kong. The government has invested a lot of resources in this area, like the zero energy building in the Institute of Nanyang Technological University.

All in all, this new trip to Singapore makes me broaden my horizons and increases my knowledge and interest in Building Services Engineering.





### Mr. Lu Hong Chin, Odin (THEi)

In this study tour, we have mainly visited different authorities of Singapore government, such as Housing and Development Board (HDB), and joined ASHRAE region XIII 20th Chapter Regional Conference held there.

The most memorable technical visit in this tour was visiting my nice home Gallery of HDB. There are 5 flats for demonstration, which is larger than most of the flats in Hong Kong. I could feel the size and space when entering 5-room flat, which is over 100 square meters flat. However, there are lack of lands in Hong Kong. The flats in Hong Kong are smaller than that in Singapore, although the area of Hong Kong is 1.6 times of that of Singapore, which is 710 square kilometers only. Observing the small flats could give me some idea about building internal design. The two 2-room flats for demonstration have installed with sliding doors. It can create more visual space in the flat. Most of the design in Hong Kong are used swing door, which is required more space for swinging. To improve the door design, I thought using pocket door is a better choice that it can provide a good appearance and create more space for furniture.

Besides the technical visits, there was banquet dinner of ASHRAE region XIII 20th Chapter Regional Conference, which is held in Hilton Hotel, on the fifth day of the tour. I saw different culture, like music instruments and dancing, from other Asian countries from the students' performance by different chapter. Besides that, I can meet some new friends in other countries to know more about their cultures, languages and studies.

Throughout the study tour, I can meet different students from other institutions. As I am a new student for Technological and Higher Education Institute of Hong Kong, I can meet some students as friends and mentors for my studies in the future. Besides the new students, I understand more about my new teachers, Dr. Sam Hui, Dr. Ernest Tsang, and Dr. Luo. That can help me easy to understand what they will teach me in the lectures. I am glad to join this study tour and I hope I can help the Chapter Regional Conference hosted in Hong Kong next year.

### Ms. Kong Ka Yan, Christy (THEi)

Singapore is usually treated as the competitor of Hong Kong because they have lots similarity, especially in the shortages of water and land. During the 7-day in Singapore, I have visited several places and found out how Singaporeans overcome the social problems.

For me, visiting Housing & Development Board Gallery and showflats is the most exciting part in the tour. To avoid speculation of the flats and promoting social harmony in the estate, HDB set up some rules to control the selling of flats in open market and number of residents from different ethnic groups. In visiting the showflats, we were amazed by them because of the low price. Under the hardship of getting a flat in Hong Kong, we admire those Singaporean who can buy large flats with affordable price.

It is my pleasure to be one of the participants in CRC. We met lots of university students from different places. Before we performed on the stage, they gave us some great support. During the technical tour of Energy Efficient Chiller Plant, I have learnt more about the latest technology of the operation of chiller plant.

The social problems facing by Singaporeans is similar to those problems in Hong Kong. After joining this trip, I found that Singaporeans have clear visions and plans to overcome the social problems. We may learn from their ideas.





### Mr. Kwok Tsz Yin, Jack (THEi)

I am very excited to join the Singapore study tour as a THEi year 2 student. The reason is that I can understand more different HVAC knowledges, improving my communication skill and my leadership in this meaningful trip.

On 26 Aug 2017, I went to a chiller plant which under the supervision of a HVAC company -- Kear. "Kaer Water" is the latest offering by Kaer, which bundles all of the services into one comprehensive package. Simply, it is outsourcing of your air-conditioning chilled water production to one trusted supplier.

Kaer designs, pays, owns, monitors and operates the HVAC system within the building and deliver reliable, constant chilled water as and when required by the air-conditioning equipment. In providing this service, the building owner is spared capital investment for purchasing, upgrading, retrofitting, or repairing chilled water plant equipment, and allows our clients to focus on their core business, knowing that a trusted chilled-water professional is ensuring the performance and efficiency of their comfort system.

Secondly, we have a CRC banquet dinner on 25 August 2017. There are many different chapter student and Ashrae member such as Singapore, Thailand and Taiwan. I try my best to communicate and share hong kong living style with other country student and people, even they are speaking different accent and language.

Thirdly, I understand that everyone own unique gifts and natural leadership skills that everyone was born with and personal strengths you've developed over everyone lifetime. Redlizing and utilizing other ones gifts and strengths will assist me in being a formidable leader. For example, I let some students to finish our study tour booklet, if they are good at design.

### Mr. Kwong Hiu Fai, Eddie (THEi)

First time of visiting Singapore, a great horizon was broaden. In the whole visit, I enjoyed those impressive days. Apart from learning through technical visits, experiencing the local culture and having fun is my friends are meaningful to me.

In the days in Singapore, we have visit a lot technical visit academically. For instance, the "Housing and Development Board" and "Newater Centre". We was introduced with the housing policy, current living circumstance and their history in HDB. We make comparison between Hong Kong and Singapore, it is a unbelievable for a citizen can have their estate much easier than Hong Kong.

In Newater Centre, we was introduced the current water usage in Singapore, further, we know more about the steps of Newater production. I am quite wondering if the water can be cleaned after filtrated for lots of times and be cleaned. Indeed, I tried the bottle of Newater after visiting and it tastes normal and nothing special. In the meantime, museums were visited by the days in Singapore. The most impressive one is "National Museum of Singapore", such a massive information about the nation history of Singapore is demonstrated.

Besides, we have visited the local University, NUS and NTU. We have opportunities to communicate with local University students, get some information about their faculty. Academically, we visited the laboratory of NTU, which is a wonderful rotating house. It is used for calculating the load under different angle of sunshine. Undoubtedly, it is a high technology which can only be seen in those place.

The biggest challenge is to perform in CRC. We have no enough time and resources but we are still success to make fun for audiences.

At last, I really thanks ASHRAE and our schools which give me an opportunity to reach other places for learning, and the teachers, students' efforts helped so much in the project.





### Mr. Lam Hin Shun, Thomas (THEi)

In this meaningful Singapore tour, students are able to exchange ideas with locals and foreign participants by visiting National university of Singapore (NUS) and joining the ASHARE Region XIII CRC Banquet dinner. Meanwhile, when visit the Housing & Development Board (HDB) Gallery, NEWater Visitor Centre (PUB) and Energy Efficient Chiller Plant, students may apply knowledge in new energy technology, building environmental design and imaginative thinking.

For instances, during the ASHARE Region XIII CRC Banquet dinner, Hong Kong students may gain chances communicate with foreign participants, like asking them whether they would join exchange programmes which are provided by Hong Kong university, introducing the delicious local food and famous restaurants and also capture funny group photos. Besides, in order to keep contact in future, some participants exchange email address, facebook and instalgram title. Some even wish to take part in next year ASHARE Banquet dinner which is held in Hong Kong and also go sightseeing in this vibrant city. Therefore, in this wonderful annual events, participants are allowed to do cultural exchange with overseas participant and they may get mutual understanding in Asian countries.

Moreover, once visiting the Housing & Development Board (HDB) Gallery, students may understand the Singapore housing development and policy deeply. To illustrates, even though there is huge population and lack of developing land in Singapore, local citizens, especially underprivilegeds are allowed to live in spacious flats due to proper housing policy. Unlike Hong Kong, Singapore government help citizens construct well-developed housing estates and locals are allowed to loan or purchase at reasonable prices. The housing property won't be affected by Real Estate Hegemony issue and it is obvious that poor won't live in subdivided flats or streets which bring more comfort to them. Hong Kong government may take it as reference and learn the merits of Singapore' housing policy.

Ultimately, we should say thank you to all teachers and helpers who help organizing this wonderful Singapore tour. Hope we can join the ASHARE activities, especially ASHARE Conference and Banquet dinner in the coming year.

### Mr. Lee Yu Ching, Angus (THEi)

My experience studying in Singapore for a week was incredible and it was truly an unforgettable experience. This was the first time I participated in the study tour and it was quite special chance for me to travel with my Thei teachers, schoolmates and ASHRAE student members. I visited Singapore for the ASHARE Chapters Regional Conference and have learned many things from this trip.

To be honest, I was not good at communication with other new teammate .During this study tour, I learn how to maintain and interact a positive relationship with my teammate. Also, I had a hand in the CRC seminars, it was honor to join banquet dinner. On the other hand it was the great chances to exchange and shared our Hong Kong lifestyle with student from different countries such as Singapore, Malaysia, Philippines and Taiwan. Since It was my first time to meet exchange student and learn their cultural, it somehow did mean a lot of experience for me through the tour.

Hong Kong and Singapore are similar ,especially in size of region and population .Though the visit of local university of national University of Singapore, I were given a chance to listen and grasp with local students ,let us to understand the circumstance of Singapore and awareness as well as reflecting on dissimilarities.

I found that Singapore is a green country, it was never difficult to find trees, leaves and green building. Comparing with Hong Kong, although there are numbers green trees in the street, recycling are not comments habits in Hong Kong. We all know the protect environment concept, however we ignore it and create many pollution to the environment. After this tour, I think it is important that we should learn Singapore. We need to do is action the way we should pay attention.

I would like to thank the ASHRAE Hong Kong Chapter .I have a great experience in this study tour and hope that I can travel to Singapore once again.







### **Ms. Leung Ching Man, Mandy (THEi)**

I am very grateful to have the chance for going to this study tour. Singapore is a sustainable and well-developed country with less resources. This study tour contains many different types of elements including city development, green and sustainable technology and the building services engineering. In this study tour, we visit many different sites to see and learn about these knowledges. Singapore will recycle many things although it is common, such as water. They will clean up the waste water and it can be used in the industry and drink. Also, they care about the relationship between human and the nature. The Gardens by the Bay is a good example, it built up a place that let the citizen can have a natural area and it contain many sustainable technologies for protecting the environment. After this study tour, we know that Hong Kong still have many things that need to improve and can reference to the advantage of Singapore in environment protection and energy saving.

The most memorable place in this study tour is Building and Construction Authority (BCA) Gallery & BCA Skylab. Because the Skylab can rotate 360° and it is containing both reference cell and testing cell. It can find out the most energy efficient by testing different ratio of using the air conditioner and lighting system. This laboratory is difficult to appear in Hong Kong.

I would like to thank for the ASHRAE for giving us the opportunity to having this study tour. It makes us have a good time to exchange with the student from the other countries. Thought the exchange, we can know more about the culture and meet more new friends from other countries. I would also like to thank for Dr Sam Hui for taking us and guiding us in the study tour.

### **Mr. Leung Ming Kei, Jonathan (THEi)**

I am glad that I can be a part of this study tour. Singapore is a great city. The architectures of Singapore are mostly being well designed. During this trip, we have several chances to have different visiting tour in gallery and buildings which provide us an opportunity to learn from The Country of Gardens.

Firstly, about the Urban Redevelopment Authority Centre's Singapore City Gallery. This gallery mainly separate to be 10 thematic areas. For me, the following 4 is the most impressive. Vibrant Cities, having a 270-degree panoramic show about the sights and sounds of the beautiful Singapore. Periods of progress, giving us an idea of how Singapore overcome many challenges and transformed from a fishing port to a cosmopolitan city. Urban Design, it shows us that the master plan of the whole Singapore's land usage. Central Area Model, giving us an exclusive bird's eye view of Singapore's central area at one large architectural models.

Second, about the Housing & Development Board Gallery. This gallery is mainly talking the public housing history of Singapore. It gives us some idea about how Singapore public housing looks like in the past and transform. There is a 360-degree movie that talk about the daily life of living in public housing. The Gallery also provide us some ideas about the public housing policy. For example, people can only sell their flat with the same race which is used to keep the race ratio remain the same in the area. These are quite new and unusual compare with what we do in Hong Kong.

Third, about the New Water Visitor Centre. This Visitor Centre mainly used as promoting how new water is being used in Singapore and why it is worth. During the visit, the staff show us how the dirty water is being filter and how purification is done which consists of several steps to complete the NEW water process. At the end of the visit each of us can take a bottle new water away.

To conclude, this study trip provide a great opportunity for student in ASHRAE to know more from the place out of Hong Kong.





### Ms. Li Hong Yi, Connie (THEi)

I am happy that I got the chance to join this study tour to Singapore. To visit other country is a good way at learning because you can have deeper impression than you learn from the book. In this tour, I had learned many different knowledges that related to my study and it is very useful for me.

The itinerary of academic tour is different from the holidays travel. We are going to some specific places that you will not go when you in travel, such as Building and Construction Authority Gallery & Skylab or National Museum of Singapore. Those visits are significant, I can know more planning and culture about Singapore.

In addition, the CRC banquet dinner was wonderful. We can meet the students from other country and have opportunity to get some new friends. The party performance is amazing, I can feel everyone try the best to show the features of their country.

For me, I think visit Garden by the Bay is the most unforgettable in the tour. In Flower Dome, you can see display of flowers and plants from the Mediterranean and semi-arid regions. Pace into Cloud Forest, it is a mysterious place veiled in mist and can see a height of 35 meters waterfall. At night, I was surprised to see the lighting of Supertree Grove, it is more beautiful than afternoon. This is a place that worth to go when you travel in Singapore.

Finally, I really want to say thank you to everyone in the tour, they are the key persons let me having this nice tour. I hope all of us are enjoy at this Singapore visit.

### Mr. Lo Tik Chi, Tik (THEi)

Between the dates of 21st-27th of August, I had joint a meaningful Singapore study tour which is held by the ASHRAE Society.

In this trip, we visit many Singapore's famous exhibition, such as, Urban Redevelopment Authority (URA) Centre's Singapore City Gallery, Botanic Gardens and Public Utilities Board (PUB) NEWWater Visitor Centre. These visit not only let me know more about the development progress of Singapore, but also the technology and knowledge which turn Singapore to one of the well-urban development country.

Other than visiting exhibitions, we also go to National University of Singapore to have an exchange with their students. After the visit to National University, we discover there are some advantages for the National University of Singapore that we should learn for.

Moreover, not only academic. In the last three days we join the CRC banquet dinner. In these dinner, we met many students from different Ashrae student branch. Each student branch also prepare and perform with the characteristic of their own country. Everyone enjoy the time in this banquet dinner.

Although Hong Kong has already been a developed city, have to take other countries as example to continue the stable development. After joining this Singapore study tour, hope I can apply the knowledge that learn from the Singapore to Hong Kong so as to make Hong Kong become a better place.





### Mr. Mak Chi Teng (THEi)

In this study tour, I have never imagined that I could learn so much from Singapore in different aspects.

Firstly, In Day 2 morning the visit to Urban Redevelopment Authority Centre's Singapore Gallery, I think that the utilization of land in Singapore is comprehensive than Hong Kong. In order to maximize the value of land in Hong Kong, the government would grab the agricultural, take down trees for building a tallest, airtight building. However, this would make people lack of leisure facilities, scenic view and even curtain effect. In Singapore, the urban development team has added lush greenery idea into the design. As a result, the building in Singapore can enjoy the river view instead of concrete jungle in Hong Kong. Also, trees are planted among the road, pavement and green rating building. This could make the city become greener and absorb a portion of greenhouse gases generated by using fossil fuel. The consciousness of green feature in Singapore is much better than Hong Kong. I think Hong Kong can do better on allocation of land resource, making Hong Kong a place to enjoy life rather than to survive.

Secondly, In Day 4 morning visit to the Public Utilities Board NEWater Visitor Center, Singapore has a better conservation of water resource than Hong Kong. There is increasing demand for potable water in the world. Singapore has reclaimed the used water into potable water. The used water is being treated under microfiltration, reverse osmosis and ultraviolet disinfection. NEWater plant supply the country with 40% of total water resource. I think Hong Kong can invest more money into this technology because Hong Kong is too relying on Dongjiang water. Using about 10 billion HK dollar each year to buy Dongjiang water which is quite waste of public fund.

Thirdly, In Day 5 evening I have met the student from different country on CRC banquet dinner. Through communicate with them, I have learn their language and get a better understanding about their country's culture. I also have taken photo with them. I was quite amazed by the student performance, especially by Philipppians' special instrument; it is comfortable to listen the song.

In this 7 day Singapore Study Tour, I enjoy this trip much and I want to thank the teacher from THEi and student who put much effort on this trip.

### Mr. So Ka Him, Ernest (THEi)

This is my third time to Singapore, the first two times I been to Singapore were more than ten years ago with only a bit memory I could remember. This would be a chance for me to recall my memory and review the modern Singapore.

This is a great chance for me to join this study tour with students from different institutes, this study tour had provided me an opportunity to try several things and broadened my horizon. In the pre-trip meetings, I had the opportunity to meet and cooperate with those participants who studying in other institutes from me. And through the CRC events, we could meet the students from other countries' chapters as well, which provided us an opportunity to communication and learn from each other.

The most memorable event for me in this tour is the visit to Housing & Development Board (HDB) Gallery (Housing) and Showflats. Before the visit to the HDB, Dr. Hui had introduced several public housing estates of Singapore to us during the tour, I was amused by the external façade of those estate and popped up with the question of why there is a such big different between Hong Kong and Singapore. During the visit of the HDB Gallery, I could know that the Singapore Government had put many effort into public housing development, which aims to providing a wonderful living environment to the citizens.

Last but not least, I would like to express my sincere thanks to the Hong Kong Chapter that organizing such meaningful study tour which is a treasurable experience for me.





### Mr. Tse Ling Ho, Adrian (THEi)

"Wherever I am feeling low, I look around me and I know, there's a place that will stay within me..." the melody rose when the HDB's video began. A song that has been singing over 19 years in Singapore called "Home", a national day theme song in 1998. The song reveals how Singaporeans love their nation, like their shuttle of everything. Singaporeans have a very strong sense of belonging to their nation. During the trip, the flag of Singapore arose everywhere since it was the national month. People hanging their flag outside their flat to decorate and celebrate the 52nd anniversary. The majority Singaporeans share the same views as the government does, courage, conviction and ambition, which draw Singapore to this prosperous limestone. I believe that is what people in Hong Kong should learn from, the way that they engage with the government and the nation makes them develop rapidly and step further as well.

Success comes with an all-rounded planning before commencement. HDB indicates how planning becoming so crucial for a city. Singapore does a tremendously great job in town zoning and planning, each town and HDB flat has been well considered the races ratio, necessities retailer, transportation, education, job opportunity and recreations infrastructures. These elements assist new town to be more appealing for people to move in and foster the satisfy level of residents in town. A great planning always draws us to the path of success, in this trip, a lot of examples illustrate how a good and well-prepared start can lead us to an ultimately positive result.

The trip to Singapore means a lot to me. I made a lot of good friends from different universities in different majors and had so much memorable great times with most of them. Also, I understood more deeply about how Singapore works things out in their well-organized and systematic Singaporean means. More important, I found out the story behind the glorious applause is dedicated by so much sacrifice by the Singaporeans. But, it is worth.

### Mr. Wong Kin Shing, Thompson (THEi)

I am pleased to be one of the Singapore Study Tour delegates. This is my first time to join ASHRAE Study Tour and CRC conference, a comprehensive understanding about team and myself are developed deeply via study tour.

A team, should have a clear position. Someone is good with rise to the occasion, someone is good with action before think twice, someone is good with art performance, someone is good with weighting the advantages and disadvantages. Everyone is doing his own works, then a team run smoothly, efficiently, effectively. As a participant of the study tour, I explored deeply about team work via the study tour since I saw everyone is participating on the trip actively with their role.

Apart from personal growth, this study tour also deepen my knowledge about how to make laboratories and commercial buildings smarter to maintain their energy efficiency entitlement, a deep reflection about whether a green building certification is benefiting to our air-conditioning performance and energy sustainability.

Last but not least, study tour help me to explore my personal network and knowledge, and also know more about other country's culture for extending my horizon. Thanks Dr. Sam to organise this study tour and everyone's participation.





### Mr. Wong Wai Lok, Jerry (THEi)

This is my first visit to Singapore. It really impressed me by its diversified culture and innovative building design. As an engineering student, I feel enthusiastic about the professionals related to my field of study. Through the technical visit section, I could learn more about the advanced technology especially for HVAC systems and water handling methods. For instance, Newater Centre shows that the bold idea about turning used water into fresh water in order to provide sufficient water supply, I strongly believe that Hong Kong may consider it as one of the possible solutions in water usage.

Apart from technical aspect, this study tour also gives me a great opportunity to meet different people and understand the history and culture of Singapore. For me, the most impressive part is to visit National Museum. It wisely uses the high-technology to illustrate the past histories and memories. When I first entering in, I have a feeling that I actually going back into those historical moments for Singapore. Overall, I am very thankful that I could join this study tour together with many my peers.

### Mr. Koon Ngai, Tommy (PolyU)

In this Singapore study tour, I am able to learn more about the urban planning and green building technologies through visiting and site-seeing. These experiences had widen my horizons which may not be absorbed in the lectures.

In this trip, there are many university students participant and it's a great chance to meet new friends in building services field. Apart from meeting friends from other university. Through the CRC Banquet Dinner, I also meet friends from Thailand, Philippine .I enjoyed this trip so much as I could learn and travel in a multi-cultural city.

I also realized it's important to have a good urban planning in a city 's overall development. For example, we could see lots of old buildings on the street, and Singapore's government could still protect their culture and heritage well. Citizens or tourist could truly enjoy and appreciate the old buildings.

On the other hand, I also appreciate Singapore's housing development so much .As in Hong Kong, the public housing supply had faced a shortage problem and it couldn't fulfill the demand in Hong Kong. However in Singapore, 80% of citizens are able to live in the public houses ,which improve their quality of life and without worrying much about housing.

Also, by visiting National University Of Singapore, I was able to experience the university's faculty, facilities and have a look in the university's department . This let me reflect about my learning in Hong Kong. As Singapore had put lots of resources in discovery and surveys about building technologies and promote into the public. The above made me appreciate a lots which Hong Kong could also take references on it.

In overall, this study tour had brought a lots of culture experiences and memories in Singapore, I hope in the future day, I might have working opportunity to participant in Singapore's Project.





### Mr. Lui Chung Ho, Gary (PolyU)

It was a wonderful trip which widened my horizon and enriched my knowledge. Upon arrival in Singapore, the first thing came into my eyes was a lot of tree. It is the policy established by the government that all trees must not be cut down without permission, even on the private land. This policy makes Singapore to be famous of greening their territory and leaves stunning impression on tourists including myself. The places we visited like Botanic Garden and Garden by the Bay show biological diversity in Singapore. The same concept also applied to public housing arrangement to prevent the formation of ethnic enclaves through the Ethnic Integration Policy.

As both Hong Kong and Singapore face the same problem – water supply is depending on other countries, the visit to NEWater visitor centre became very meaningful to see how Singapore government adopted innovative way and made use of new technology to develop new water sources. In my opinion, the concept of NEWater is worth adopting by the HK government as it is not only about self-sufficiency but also conserving natural environment, and fully utilizing the resources that we have.

Another visit that leaves me deep impression is Skylab in BCA. As BSE students, we always want to integrate our knowledge with the latest technology to make building services more efficient, environmentally-friendly, and reliable. Singapore government took initiatives in this field to test whether the technology is suitable for Singapore by building the expensive Skylab. By analysing the data obtained in Skylab, the government can decide if that new technology is worth promoting. I think that HK government should put more resources and efforts to study new technology rather than only following others' steps.

Another featured activity was ASHRAE CRC. The seminar gave me lots of insights into the design of efficient chiller plants, and the achievement of energy saving by demand based control. During the banquet dinner, it was a memorable moment to meet students from different chapters. They were very friendly and also liked making new friends. I remember the students from Indonesia taught us how to play their music instruments used in the performance. It was a very nice time with them. I wish to have next opportunity to take part in ASHRAE study tour, and meet more people from all around the world.

### Mr. Tsang Cheuk Yin, Sam (PolyU)

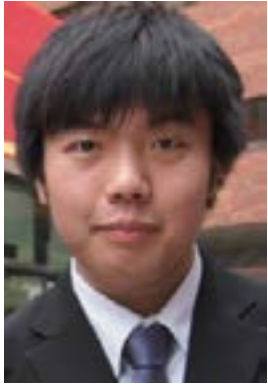
The Singapore study tour held from 21 Aug to 27 Aug was a successful and memorable trip. In the trip, there were site visits that relate to HVAC and building services related areas that inspire me. The technology and policy adapted in Singapore is shown in the site visits that I haven't learnt and can be learn in my future studies and career.

In the third day we visited the Housing & Development Board (HDB) Gallery (housing) and showflats. It showed the government agency city's planning and different schemes to improve public housing quality such as the Home Improvement Programme (HIP) and Neighborhood Renewal Programme (NRP). It indicated the sustainability and environmental planning in the city. On the other hand, large scale of green areas and trees help to reduce air pollution and create a more relax atmosphere. Variety and creative design of public housing in Singapore showed different shape of design with many environmental aspects in it to keep it green. The showflats indicate different size of public housing to let us know more about the internal design of it which help to compare to Hong Kong public housing.

And in the CRC banquet dinner, it was a great time to meet a lot of new friends from different countries and chapters from ASHRAE. We had a good time to share not only the knowledge, but also the culture from each country. We perform different performance and exchange gifts to different chapters.

All in all, I have learnt many technologies in Singapore and it might be also useful in Hong Kong. Meeting new friends help to widen my horizon and I hope I can join the next CRC conference in Hong Kong.





### Mr. Wan Wing Kit, Victor (PolyU)

This Singapore study tour has offered an incredibly valuable opportunity to explore – not only the momentousness of socio-economic development of all Singapore through various site visits, but also the sense of dealing with others from foreign countries.

Enhanced were my communication and gregarious skills; to be in first chiefly pivotal, by chatting with others in ASHRAE Region XIII CRC Banquet Dinner. It gathered a wide range of students from twelve different countries or nations, including Hong Kong, for promoting cultural exchanges and international cooperations in Asia. Having met friends from Malaysia, Thailand, Taiwan and Singapore, this dinner also provided a gorgeous chance for Hong Kong students grooving directly. After experiencing the pleasure from the dinner, in other words, I was become widely enjoyed peregrinating in this trip – no longer like a frog in a well.

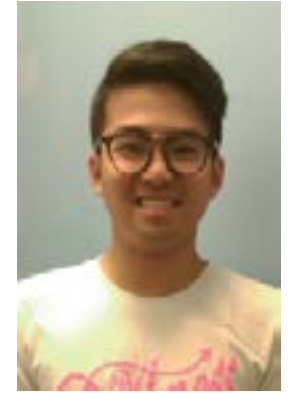
Also appreciative was the Singapore's public housing system among the HDB Gallery visit; further and even more importantly, the government has fully utilized the land in developing the housing as concerned the likely future shortage of housing supply. Around 80 percent of inhabitants living in HDB flat are sold with a 99-year lease agreement. Hong Kong, however, is facing the severe problem of landscape shortage and skyrocketing property prices because of the inadequate action plan and perfection in urban planning. In the wake of this technical visit, I have found that there are still numerous improvements to make Hong Kong better by fighting for our country – by enthusiasm, by diligence, and by intelligence.

It was a worth-while experience for our Hong Kong students to not only broaden horizons, but also overcome our weaknesses by acquiring others' strong points. While by no means insurmountable, the problems now presented in Hong Kong are likely resolved by perfecting and equipping ourselves.

### Mr. Wong Yat Kuen, Eric (PolyU)

In this Singapore trip, we visited lots of places with many academic contents, like public Utilities Board NEWater Visitor Centre, Housing & Development Board Gallery, NTU and so on. And I am amazed with the public housing in Singapore. In their public housing policy, single and unmarried parents cannot purchase HDB flats but there is a policy which calls 'HDB marriage'. It is about a new couple gets married in order to become eligible to submit an application for a HDB flat and waits for its completion to house the new family. HDB flat consider the application based on income level, number of children and social status ranked according to professions. Also, the government promise to provide majority of citizens owning the flats. Therefore, HDB also plays a crucial role in promoting social cohesion and ethnical integration within the country by carefully planning different ethnic groups to live together following the composition of the population.

Apart from this, we also had a visit to NEWater and learnt a lot about the water treatment. The first barrier is the conventional wastewater treatment process and the second, third and fourth barriers are from NEWater production process to use micro-filtration, followed by reverse osmosis and subsequently ultraviolet disinfection to produce reclaimed water from secondary effluent. The water is ensured for people drink directly but Singapore government treats it for indirect potable use by blending it with reservoir water where there are minerals and chemicals, and further treatment before supplying to households. The production of NEWater has proven to be more cost-effective and viable alternative and Singapore is going to achieve a higher degree of self-sufficiency and a less dependent position on Malaysia for fresh water. Therefore, Singapore can enjoy greater leeway in future negotiations with Malaysia on many bilateral issues by putting both countries on a more equal footing.





### Mr. Chu Long Yin (HKU)

It was my honor to join the ASHRAE Singapore Study Tour 2017. Held between August 21st and 27th, the seven-day study trip gave me a fruitful and unforgettable experience in the Lion City. Singapore has always been regarded as one of the major opponents of Hong Kong in the Asia-Pacific Region. The two cities have shared a lot of similarities in terms of historical background, geographical location and economic development so I would like to take this opportunity to gain an insight into this city state. In the first part of our tour, we visited several galleries and museum in order to learn more about the history and recent development of Singapore. They included URA Gallery, HDB Gallery and National Museum of Singapore. For the second part, we attended the CRC seminars, banquet dinner and a number of visits organized by our fellow Singapore Chapter. We also had lots of chances to exchange and shared our thoughts with students from different Asian regions such as Indonesia, Malaysia, Taiwan, Thailand, and the Philippines. It was a golden opportunity for me since I like to meet new friends from diverse cultural backgrounds and learn from them. I was even able to practice my Malay and Thai with them though my proficiency in these two languages were very limited. I was truly overwhelmed to join these kinds of activities since I could never imagine participating in them as a university student. I really learned a lot from them, not just the engineering knowledge but more importantly, how engineering transformed and helped our society. I would also like to take this opportunity to thank the ASHRAE Hong Kong Chapter and our Tour Leader Dr. Sam Hui for their support and assistance to this study tour. It was undoubtedly the best study tour I have ever joined and I sincerely hope to join it next year!

### Mr. Chung Hing Kit, Jacky (HKU)

I am glad that I can join this ASHRAE Singapore Study Tour. I have not been to Singapore, and I just know Singapore is a modern city, like Hong Kong. After joining this study tour, I gradually understand how Singapore is successful in living infrastructure.

First of all, Singapore government provides enough public housing with fair price to the citizen. When I visit Urban Redevelopment Authority (URA) Centre and Housing & Development Board (HDB) Gallery, I realized that Singapore must have public house with fair price and reasonable flat-area under their government's policy. What is more, their government always control the population of different race in each community in order to build the international community/city.

In addition, I visited the Public Utilities Board (PUB) NEWater Visitor Centre, and I realized that their government will collect the waste water from all building and have some water-treatment to produce the NEWater. Thus, their government can ensure the water supply and reach environmental-friendly.

Also, I attended the CRC technique seminar and tour, and I learnt some advanced energy technology in HVAC system, and these advanced energy technologies can help to improve the efficiency of HVAC system.

To conclude, I think this study tour let me to know more about Singapore, not only technique knowledge but also culture, and I can apply them in my future career. Additionally, I also made many new international friends via ASHRAE banquet dinner. Therefore, I appreciate ASHRAE gives me this opportunity to study in Singapore.







### Mr. So Tsun Hin, Patrick (HKU)

In August 2017, ASHRAE organized its overseas cultural study tour for the ASHRAE student members. All the 36 participating students, led by Dr. Sam Hui, Dr. Ernest Tsang and Prof. Moses Ng, departed with great excitement for the 7-day journey in Singapore on 27 August 2017 (Sunday). Since it was the first overseas trip to some students, it somehow did mean a lot to them while they would experience many of their "first-time" throughout the tour.

There were several unforgettable and meaningful visits in the trip. For the Zero Energy House, although it was not a very successful example (as it failed to be truly energy self-sufficient with its application of the air-conditioning system greatly increasing the energy consumption), it was still a good demonstration for reference. We hope that in the future, not only in Singapore but also in Hong Kong, new constructions could all adopt these energy self-sufficient technologies and the energy efficiency of the old constructions could be improved with some simple energy-saving strategies, thus protecting our environment.

In the morning of our fourth day in the trip, we went to the NEWater Plant. A question had been asked, "How is new water produced?" In fact, new water can be produced through four main processes. Water is a valuable resource. We do need to conserve it. While we enjoy the water, let us think about the value of water.

Gardens by the Bay were the wonderland in Singapore. We have never seen such a beautiful garden before. In the flower dome, there were different species of plants growing inside a dome with a low temperature. It was unexpected that all of the plants could live under the same condition, especially the cactus.

Although we had only stayed for a week in Singapore, I think that Singapore is a clean and bright country with educated citizens. We hope we can visit this green country again in the future.

### Mr. Szeto Ka Wa, Andy (HKU)

Singapore study tour is a memorable experience to me. We have been various famous places and visited a lot of sites, which relate to building services engineering. Through this unique opportunity, we have gained a better insight of Singapore and broadened our horizon.

Someone said that Singapore is similar to Hong Kong, but after this study tour, I found that they are quite different. First, generally, the building design in Singapore is outstanding. For example, the gorgeous hotel, which named Marina Bay Sands, is hard not to notice. We can recognize it from miles away. Also, Singapore is more international than Hong Kong since there are a lot of people came from another country like India, Malaysia etc. Almost everyone in Singapore can speak a fluent English, therefore even a foreigner can live in there comfortably without a communication barrier.

There are several events that I really enjoy, such as the NEWater factory tour, the NUS visit and the visit of Garden by the bay. The world leading technology of water purification Factory is amazing. The beautiful campus in NUS is desirable for every university students. The visit inside Garden by the bay is breathtaking. Despite these sites are so unforgettable, my personal favourite event still is the CRC banquet dinner, since we have met plenty of students from different countries, like Malaysia, Taiwan and Thailand. We have chatted for a long time during the banquet dinner and I believe our friendship will continue even when we left Singapore.

At the end, I would like to express my appreciation to ASHRAE Hong Kong Chapter and ASHRAE Singapore Chapter. Without their kind support, we would not able to enjoy such a wonderful study tour. As I know, the CRC will be held in Hong Kong in the upcoming year. I cannot wait to see my friends come to my home land.





### Mr. Yeung Ting Fung (HKUST)

It is really amazing for me because I never see the huge scale of architectural models in Hong Kong. It looks like the real city that every detail such as river or window in the building can demonstrate clearly.

I study engineering in Hong Kong so I can understand their challenge and difficulty in refurbishment. But urban redevelopment authority did the great work. They integrated the urban planning and development in Singapore that increases variety of streetscapes and modulate the scale of urban fabric, creating the visual contrast and excitement within the city while protecting the important reminders and also representations of the history of Singapore. Moreover, the conservation of built heritage adds to the distinctive character and giving it a sense of history and memory of place. It makes me think about Hong Kong heritage and we also need to protect them because it has the uncountable value and memory that cannot replace by urbanization.

### Mr. Yeung Tsz Fung, Charles (HKUST)

Singapore study tour is an unexpected experience to me. I have been a variety of sights and visited considerable technical site relating to building technology. Through this unique opportunity, the insight of Singapore is improved.

Singapore is like Hong Kong, but after this study tour, it is found that they are quite different. First, generally, the architecture design in Singapore is quite outstanding. For instance, the gorgeous hotel, which named Marina Bay Sands. Furthermore, Singapore is more international than Hong Kong as there are a lot of people came from various country like India, Malaysia etc. Almost everyone in Singapore can speak a fluent English, therefore even a foreigner can live in there comfortably without a communication barrier.

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Eventually, I would like to say thank you to ASHRAE Hong Kong Chapter and ASHRAE Singapore Chapter. Without their kind support, we would not able to enjoy such a wonderful study trip. As I know, the CRC will be held in Hong Kong in the upcoming year. I cannot wait to see my friends come to my home land and be a coordinator/helper to hold the CRC.





### Mr. Ng Tin Kuen, Billy (CityU)

The tour to Singapore has been a wonderful and unforgettable experience. It has given me the chance to visit different tourist attractions and meet with a lot of students from different chapters. Through the interactions with the students, and the observation about their lifestyles, I believe I have learned more about their cultures and beliefs, and it is found that these people do not always act like what we have learned from the tourist guidebooks or websites, as the information provided in these publications can only give us a general picture about these foreign cultures.

After a deep interaction with them, what we actually felt was their truly passion and kindly face. Surely, we also share our Facebook and Instagram account contact to them so as to spread the happiness to the world! Eventually, we have a promise that we would their personal tour guide if they will come to Hong Kong next year!

### Mr. Tsang Kai Kwong, Dennis (CityU)

ASHRAE Singapore study tour 2017 is truly a highlight of this summer. We went to different places in Singapore, for example, the chiller plant room operated by Kear Air, National University of Singapore as well as NEWater as so on. We explore Singapore from the culture and buildings. In the CRC banquet dinner, we have a great chance to build up the relationship between different universities' student branch from Asia. Like students from Taiwan, Thailand, Malaysia and other countries in Asia. We chart about our university life, the places that we have been in Singapore, talk about everything under the sun. It is a remarkable chance and place to know so many friends from all around Asia. Hope that we can meeting again next year in Hong Kong CRC 2018.

In this tour, we also know how Singaporean solve the problem of shortage of water by recycling the waste water. Hong Kong can learn a lesson from Singapore to increase recycling rate of potable water. Another highlight of this study tour is the HVAC company Kaer, the concept of Kaer is very interesting. The goal of this Kaer is to make air-con simple and easy to manage in order to save more energy and protect the environment. At the time, Hong Kong doesn't have much this kind of company. So I believe this can be one of area that Hong Kong engineering company can move towards.

After all, this study tour give me the chance to explore the HVAC and different culture outside Hong Kong and making friendship with different peoples around Asia.





# Gallery







## Shaping Tomorrow's Built Environment Today

### Jointly Organized by:

- ASHRAE PolyU Student Branch
- ASHRAE CityU Student Branch
- ASHRAE HKU Student Branch
- ASHRAE IVE Student Branch
- ASHRAE HKUST Student Branch
- ASHRAE THEi Student Branch

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Our journey never ended.