

BUILT ENVIRONMENT LIFT  
INDOOR AIR QUALITY LIFT  
SERVICEABILITY  
BURGLAR ALARM AND SECURITY  
ACOUSTIC CONTROL  
DIGITALIZATION SMART BUILDING  
TESTING AND COMMISSIONING  
ENERGY BENCHMARKING  
BUILDING PERFORMANCE  
ILLUMINATION  
MAINTAINABILITY POWER QUALITY  
DAYLIGHT AND SOLAR GAIN  
TRANSPORTATION LIGHTING  
DISTRICT COOLING LIGHTING  
PLUMBING AND DRAINAGE  
FIRE AND SMOKE DETECTION  
DISTRICT COOLING  
HEAT RECOVERY BIM



**ANNIVERSARY**

**THE CHARTERED INSTITUTION OF  
BUILDING SERVICES ENGINEERS**



# **BUILT ENVIRONMENT ENGINEERING EXCELLENCE**



# 40<sup>TH</sup> ANNIVERSARY DINNER PROGRAMME

## 28 MARCH 2019

|                 |  |
|-----------------|--|
| 6:00 – 7:00 pm  | Dinner Reception (Cocktail)  |
| 7:00 – 7:05 pm  | Dinner Commencement  |
| 7:05 – 7:20 pm  | Introduction, Recognition of Guests and Opening Ceremony<br>Welcome Speech by Chair of the CIBSE HK Branch |
| 7:20 – 7:35 pm  | Speech by Guest of Honour  |
| 7:35 – 7:45 pm  | Presentation of Souvenirs to Committee Members<br><br>Toasting by Committee Members                        |
| 7:50 – 8:10 pm  | Dinner Starts and Table Game   |
| 8:10 – 8:15 pm  | Presentation of CIBSE Student Prizes   |
| 8:15 – 8:35 pm  | Dinner, Performance “Acapella” and Lucky Draw Part 1   |
| 8:35 – 8:55 pm  | Dinner   |
| 8:55 – 9:05 pm  | Dinner Game  |
| 9:05 – 9:25 pm  | Dinner, Performance “Incoming Chair ”  |
| 9:25 – 09:30 pm | Vote of Thanks   |
| 9:30 – 9:45 pm  | Lucky Draw Part 2  |
| 9:45 pm         | Dinner Ends  |

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# MESSAGE FROM THE GUEST OF HONOUR



**Mr. Frank Chan Fan, JP**  
Secretary for Transport and Housing

I take great pleasure in congratulating the Chartered Institution of Building Services Engineers Hong Kong Branch (CIBSE HK Branch) on its auspicious 40<sup>th</sup> anniversary.

Ever since its founding in 1979, the CIBSE HK Branch has been actively pursuing professional excellence and nurturing talents for Hong Kong. During the past four decades, the CIBSE HK Branch has witnessed phenomenal growth together with Hong Kong with its members playing an instrumental role to transform Hong Kong into Asia's World City.

I would like to take this opportunity to thank CIBSE members for their conviction and dedication in promoting the arts, sciences and practices of building services engineering for the benefit of all as well as advancement of education and research in building services engineering.

The theme tonight is "Built Environment, Engineering Excellence", which highlights the challenges of an ever-changing environment and the unswerving determination of the CIBSE HK Branch to strive for engineering excellence. I am confident that the CIBSE members shall continue to create and maintain a healthy, pleasant and enjoyable built environment for everyone in Hong Kong. May I wish the CIBSE HK Branch and all of you every success in the years to come.

A handwritten signature in black ink, appearing to read 'Frank Chan Fan', written in a cursive style.

**Frank Chan Fan**  
Secretary for Transport and Housing

# CONGRATULATORY MESSAGES



Mr. Michael Wong Wai-lun, JP  
Secretary for Development

英國屋宇裝備工程師學會香港分會四十周年誌慶

專才奮進  
駿業昌興

發展局局長黃偉綸



# CONGRATULATORY MESSAGES



**Mr. Stanley Ying Yiu-hong, JP**

Permanent Secretary for Transport and Housing (Housing) /  
Director of Housing

I have great pleasure in congratulating the Chartered Institution of Building Services Engineers Hong Kong Branch on its 40<sup>th</sup> anniversary. Over the past four decades, the Institution has been actively promoting best practices, and the advancement of education and research in the building services industry in Hong Kong. On this memorable occasion, I would like to express my appreciation for the Institution's excellent achievements in the past and wish it continued success in its future efforts.

A handwritten signature in black ink, appearing to be 'S. Y.' with a stylized flourish.

**Stanley Ying**

Permanent Secretary for  
Transport and Housing (Housing)  
cum Director of Housing

# CONGRATULATORY MESSAGES



**Ir Alfred Sit Wing-hang, JP**  
Director of Electrical & Mechanical Services

The year 2019 marks the 40<sup>th</sup> anniversary of the Hong Kong Branch of the Chartered Institution of Building Services Engineers (CIBSE HK Branch). It is a great pleasure to extend my heartfelt congratulations to the organisation on this joyous occasion.

Over the past four decades, the CIBSE HK Branch has made significant contributions to our community in different spheres of life. Bringing together a galaxy of building services engineers and other built environment professionals in Hong Kong, it has long been promoting and maintaining a high standard of knowledge, professionalism and integrity among its members. The CIBSE HK Branch has also motivated local engineers to strive for excellence in their work, both functionally and technically, and their praiseworthy efforts has contributed greatly to the success of Hong Kong.

It is the Government's policy to build Hong Kong into a world-class smart city by making use of innovation and technology as well as inspiring creativity and sustainable development. I am confident that the CIBSE HK Branch and its members will continue with their best endeavours to achieve this target through designing and constructing innovative and eco-friendly building services systems, using advanced building information modelling technology at both design and operation stages, and applying retro-commissioning techniques to existing systems to optimise operations. The commitment of the CIBSE HK Branch members to building a sustainable Hong Kong is truly important, valuable and treasured.

Going forward, the CIBSE HK Branch will no doubt continue to play an increasingly important role in shaping Hong Kong into a smarter city. I keenly look forward to witnessing its continuous achievements in the years ahead.

A handwritten signature in black ink, consisting of a stylized 'A' followed by a long horizontal line that loops back under the 'A'.

**Ir Alfred Sit Wing-hang**  
Director of Electrical and Mechanical Services

# CONGRATULATORY MESSAGES



**Mrs Sylvia Lam Yu Ka-wai, JP**  
Director of Architectural Services

I am delighted to extend my sincere congratulations to the Chartered Institution of Building Services Engineers - Hong Kong Branch (CIBSE HK Branch) on its 40<sup>th</sup> Anniversary.

Throughout the past four decades, the CIBSE HK Branch has dedicated its effort to promoting the art, science and practice of building services engineering. It has also demonstrated an important role in enhancing professional excellence in the face of the growing diversity of the industry through continuous education, research and cooperation with other professional bodies. With its outward-looking quality, I am confident that the CIBSE HK Branch will strive ahead for the benefit of the industry and the betterment of our community.

On reaching the milestone of the 40<sup>th</sup> Anniversary, may I wish the CIBSE HK Branch every success in its future endeavours.

A handwritten signature in black ink, appearing to be 'Sylvia Lam'.

**Mrs Sylvia Lam**  
Director of Architectural Services



# CONGRATULATORY MESSAGES



Mr. Wong Chung-leung, JP  
Director of Water Supplies

I am delighted to offer my sincere congratulations to the Chartered Institution of Building Services Engineers Hong Kong Branch (CIBSE HK Branch) on the occasion of its 40<sup>th</sup> anniversary.

With members of professional building services engineers from 98 countries in the world, the CIBSE provides an unrivalled platform for its members to learn, grow and practise. The Hong Kong Branch, being one of the CIBSE regions with largest number of members, has served its members and the community with excellence for the past 40 years. Based on its solid foundation of professionalism, I believe it will continue to excel with its expertise, dedication and quality services into another new page of its development.

For this remarkable milestone, I wish the CIBSE HK Branch a happy 40<sup>th</sup> ruby anniversary and an even brighter journey ahead.

A handwritten signature in black ink, appearing to read 'CL Wong'.

CL WONG  
Director of Water Supplies

# CONGRATULATORY MESSAGES



**Mr. Li Kin-yat**  
FSDSM, FSMSM  
Director of Fire Services

Established in 1979, the Chartered Institution of Building Services Engineers – Hong Kong Branch (CIBSE HK Branch) has played a vital role in the development of building services industry in Hong Kong by promoting the art, science and practice of building services engineering and advancing education and research in the field. With its continued efforts in enhancing professional practice and standards of the industry, the Institution has made a significant contribution to the design, provision and maintenance of building services, thereby greatly improving the living and working environment of our community.

On the 40<sup>th</sup> Anniversary of the CIBSE HK Branch, I would like to extend my sincerest wishes to the Institution for its continued success in the decades ahead.



**Li Kin-yat**  
Director of Fire Services

# CONGRATULATORY MESSAGES



**Mr. Stephen Lisk**  
CIBSE President

It is now forty years since the first group of building services engineers came together to create the Hong Kong Branch of the Chartered Institution of Building Services Engineers. It was a very different world, then, and few will have anticipated the role that the CIBSE Hong Kong Branch would play in the life of Hong Kong since then. CIBSE members have contributed to many of the fine construction projects that have been completed since then and won many honours, including the International Commerce Centre winning at the CIBSE Building Performance Awards in 2015. They have also contributed to vital advances in public health engineering, including the SARS outbreak and more recently concerns about lead in drinking water. Several Hong Kong Branch chairs have served the wider Hong Kong engineering community as President of the HKIE, which works closely with CIBSE. I am sure that as you celebrate 40 years of serving Hong Kong through your commitment to building services engineering, you will look forward to continuing to build on the many successes and achievements of the Branch. I am delighted to send you my warmest congratulations, and those of the whole CIBSE family.

A handwritten signature in black ink, appearing to be 'S. Lisk', written in a cursive style.

**Stephen Lisk**  
CIBSE President

# CONGRATULATORY MESSAGES



**Prof. Lynne B Jack**  
CIBSE President Elect

May I extend my thanks and hearty congratulations to the Hong Kong Branch on reaching this significant milestone! The work undertaken by the committee and its dedication and support for the building services engineering profession is, quite simply, outstanding.

I had the pleasure of visiting Hong Kong and meeting many of the Hong Kong Branch committee members last November. Like all of my CIBSE colleagues who have, before me, made such a visit, I could not be more impressed by the work of the committee and its many associated networks. The support that is made available to members, the breadth and depth of technical seminars offered and the extensive connectivity of CIBSE with a range of government, industrial and professional organisations really is excellent. The delivery of such a robust framework for the provision of professional support and expertise to a built environment sector that is rapidly evolving to reflect population growth, environmental change and technological innovation is crucial.

Importantly, such success does not come without hard work, dedication and collaboration, and I would like to acknowledge the efforts of every single person who has contributed to the Hong Kong Branch over its 40 years. May your success continue, and I wish you all an enjoyable evening celebrating this tremendous achievement!

A handwritten signature in black ink that reads "LB Jack".

**Prof. Lynne B Jack**  
CIBSE President Elect

# CONGRATULATORY MESSAGES



**Mr. Peter Y Wong**  
CIBSE Immediate Past President

I would like to congratulate the CIBSE Hong Kong Branch on its 40<sup>th</sup> Anniversary. It is a real honor for me to be the Chair of CIBSE HK Branch in the session 2001-02 and the President of CIBSE in the session 2017-18. In our Charter, we say “we exist to support the Science, Art and Practice of building services engineering”. Building services engineering is art which allows us to design a high performance and efficient building that is safe and comfortable to live, brings latest technologies to uplift our standard of living, and creates an atmosphere to experience sustainability and a technological wonder that stands out in an already modern city. You can always feel these from the winning projects of our CIBSE Building Performance Awards. The art of building services is about collaboration, intuition, invention and creative thinking to challenge and inspire the public and each other.

Over past 40 years, it is important to note CIBSE HK Branch providing qualified route to local experienced engineers to become a Chartered Engineer (CEng) which is a status that the engineering profession is proud of, that the public respects and that is valued in the industry. As a Chartered Institution, CIBSE helps define and protect those values and principles of professionalism.

I wish the CIBSE HK Branch will continue to inspire the industry to embody the spirit and values of being or becoming a CIBSE member and to promote the positive message of the values we believe in, the professionalism we treasure and the aspiration of exchanging best practice among like-minded professionals in Hong Kong and in the years ahead.

A handwritten signature in black ink, consisting of a large, stylized loop that starts at the top right, goes down and around to the left, and then loops back up to the right.

**Peter Y Wong**  
CIBSE Immediate Past President

# CONGRATULATORY MESSAGES



**Mr. Stephen Matthews**  
CIBSE Chief Executive

Important milestones help us not only to mark out special events but also to look back at progress. A 40<sup>th</sup> anniversary is always very special and especially when it is the largest CIBSE Region, who have continued to grow in numbers but also to have influence around the globe. Ten years ago the conversation was how to get CIBSE Hong Kong Branch better integrated in to CIBSE HQ. Today, the Branch provides not only a Board Member but also our Immediate Past President, both Peter Y Wong and PL Yuen represent the strengths, skills and considerable aptitudes that are so evident in the HK Branch.

Hong Kong Branch has a very special place in my heart and that heart beats stronger and louder thinking about the considerable achievements the Branch has made in the last forty years but what gives me special impetus is the exciting future ahead. The really essential part however is the people and the very special people of Hong Kong Branch. So it gives me a huge pleasure to send my personal congratulations and best wishes to Hong Kong Branch to a Region where the CIBSE torch is held high but also shines so brightly.

**Stephen Matthews**  
DL, FCIBSE, FIMechE  
CIBSE Chief Executive

# CONGRATULATORY MESSAGES



**Mr. Jeff Streeter**

Director of British Council, Hong Kong

It gives me great pleasure to extend my warmest congratulations on the occasion of the 40<sup>th</sup> Anniversary of the foundation of the Hong Kong Branch of the Chartered Institution of Building Services Engineers.

As a professional body that supports “the Science, Art and Practice of building services engineering”, CIBSE provides vital services to new and experienced practitioners alike, with education and training at the core of what it does. With more than half of the world’s populations now living in cities and with technology changing the way we work and learn at an unprecedented rate, the commitment of CIBSE to life-long learning and its focus on the built environment have never been more relevant than they are now.

In the vibrant and ever-changing cityscape of Hong Kong, I have no doubt that CIBSE’s work will remain vital to this great city’s future, just as it has been a key part of its development over the last 40 years.

My congratulations go to everyone at CIBSE, including all its members, for the great work that you continue to do.

**Jeff Streeter**

Director

British Council, Hong Kong

# CONGRATULATORY MESSAGES



**Dr. Yuen Pak-leung**  
CIBSE Board Member

Congratulates on a truly awesome accomplishment at this 40<sup>th</sup> anniversary celebration of the CIBSE HK Branch, I am very pleased to express my utmost appreciation to all those who have contributed to its success.

Building services engineering professionals have always been at the forefront of innovation, pushing the boundaries of ‘what if’ and ‘why not’ to improve the well-being of our building and built environments.

I wish our fellow practitioners would continue to innovate, in essence, is about crafting new ideas to improve the way we do things. Wonderful engineering can further be materialized through the very enabling AI and IoT, and indeed many more technologies which are now becoming readily available at our fingertips. It is a matter on how we take steps continuing to spark debate, to educate and to apply to foster innovation in this time and beyond. It is about seeing things differently, and imagining that which could be.

Have a great run time and again, and hope the streak of building services engineering professionals goes on for years to come!

A handwritten signature in black ink, appearing to read 'PL Yuen', written in a cursive style.

**Dr PL Yuen**  
CIBSE Board Member



# CONGRATULATORY MESSAGES



Mr. P K Kwok  
CIBSE Honorary Fellow

英國屋宇裝備工程師學會香港分會

成立四十週年誌慶

科技日新  
福惠社羣

郭炳基敬賀  
英國屋宇裝備工程師學會名譽院士

# CONGRATULATORY MESSAGES



Prof. Pan Yong-hua  
CIBSE Honorary Fellow

热烈祝贺

英国屋宇装备工程师学会（香港分会）  
成立四十周年

裕业利民  
荟智萃才

潘永华教授  
英国屋宇装备工程师学会名誉院士

# CONGRATULATORY MESSAGES



**Mr. Victor Cheung**  
CIBSE HK Branch Council of Management

The Hong Kong Branch of the Chartered Institution of Building Services (CIBSE HK Branch) was established in 1979. CIBS was renamed as the Chartered Institution of Building Services Engineers (CIBSE) in 1985 when it joined the Engineering Council UK as a member institution. Since then the CIBSE Hong Kong Branch has continued to grow over the past four decades and become a highly recognized professional body in Hong Kong. With some 2,800 members, the Hong Kong Branch is the biggest region of CIBSE outside UK.

Building Services engineers have made significant contributions in the development of Hong Kong, transforming from a small fishing village into a world class cosmopolitan city. Our role covers not only design and installation but also operation and maintenance of building services systems, to ensure that buildings are safe, healthy and comfortable for it's occupants and also energy efficient and environmentally sustainable.

Nowadays, buildings are becoming more complex and sophisticated to cope with society's evolution and people's aspirations, and Building Services engineers are faced with challenges such as climate change, the ageing population, advancements in information and communication technologies (ICT) and big data applications. In response, we have to broaden our knowledge and skills and be more innovative in adopting new and emerging technologies to turn these challenges into opportunities. We also have the responsibility to foster the next generation building services engineers to meet the future demand.

On the auspicious occasion of the 40<sup>th</sup> anniversary celebration of the CIBSE Hong Kong Branch, I would like to express my heartfelt congratulations and best wishes to our members. With your unfailing support, I am confident that CIBSE Hong Kong Branch will continue to play a significant role in the advancement of the building services engineering profession, not only in Hong Kong but also in the Region.

A handwritten signature in black ink, appearing to read 'Victor Cheung' in a cursive, stylized font.

**Victor Cheung**  
CIBSE HK Branch Council of Management

# CONGRATULATORY MESSAGES



**Mr. Philip Chan**  
CIBSE HK Branch Council of Management


2019 is a very special year because CIBSE Hong Kong Branch is approaching 40<sup>th</sup> year anniversary.

Looking back 40 years ago, the Hong Kong Branch was formed by a group of enthusiasts who were members of the newly established professional institution in UK – Chartered Institution of Building Services. It was then felt that we should have a local branch for Hong Kong members in the blooming building market. We all witness the growth of the Hong Kong Branch from a very green learned society of about 80 members to nowadays a successful and mature Branch of the CIBSE UK with around 2,800 resident members.

Back to 40 years ago, electrical, mechanical and plumbing services were handled by technicians in accordance with hard rules and regulations. Since 1980's, there were needs for high calibre building services professionals to design and install innovative building services systems for prestige buildings designed by signature architects. The Hong Kong Branch has successfully promoted the engineering science of building services and provide timely references from UK Headquarters for the increase demand of global knowledge of good practices.

After 40 years growth and development, the Hong Kong Branch has now been equipped with international connections and building services professionals with world class project experience. It is the time for Hong Kong members and the Hong Kong Branch to share our valuable experience with other international members, and also extend our influence with government policies on issues related to built-environment, climate change, smart city and sustainable construction methodologies.

I would like to congratulate the success of the Hong Kong Branch in the past 40 years, and look forward to witness the continuous success, development and achievement made by the Hong Kong Branch in the next 40 years.



**Philip Chan**  
CIBSE HK Branch Council of Management

# CONGRATULATORY MESSAGES



**Mr. Stanley Chow**  
CIBSE HK Branch Chair

It gives me great pleasure to congratulate the CIBSE Hong Kong Branch for all its achievements since its inception 40 years ago. The Branch which was founded in 1979 has been a stalwart engineering institution for promoting art, science and practice of building services engineering and cultivating its engineering professionals in Hong Kong. With ever growing commitment from Branch Committee, the Branch has been adhering to the purpose of creating a collaborative and highly energetic foundation with building services engineering professionals in organizing diversified activities to benefit of all and the building services engineering communities in Hong Kong, Macau, Mainland China and UK.

Nowadays, the outcomes of our initiatives have been progressively significant through enhancing our position as a regional facilitator in Hong Kong, which includes (1) deepening the long-term partnership with CIBSE networks, the Shanghai Association of Science and Technology, and various engineering institutions in Macau, (2) introducing CIBSE knowledge and guides in digital engineering application to building services, (3) developing CIBSE-knowledge based training services with CPD programme, (4) introducing the 1st ever CIBSE Hong Kong Awards launched in March 2019 to promote advancement in professional, sustainable and effective building services system design and operation.

Meanwhile, our membership support in conducting professional review interview in Hong Kong has been highly demanding. From 2017 to 2018 number of MCIBSE climbed steadily from 1,765 to 1,884 and a continual growth in overall membership is maintained and up to 2,777 in Dec 2018.

On behalf the Branch, I would like to express my heartfelt thanks to all the committee members for their great contribution, and to all past Chairs as well as CIBSE HQ and our industrial and institutional partners for their invaluable advice and continuous support.

I sincerely thanks to the editors in making this commemorative brochure so successful and full with interesting development of building services engineering and the Branch in the past 15 years.

Wish the Branch continued success as we celebrate this important milestone of its 40<sup>th</sup> Anniversary in the next 40 years and beyond.

A handwritten signature in black ink, appearing to be 'S. Chow', written in a cursive style.

**Mr. Stanley Chow**  
CIBSE HK Branch Chair

# CONGRATULATORY MESSAGES



**Dr. Raymond Chan Ka-lung**

Organising Committee Chair, CIBSE HK Branch 40<sup>th</sup> Anniversary

This year marks the 40<sup>th</sup> Anniversary of the Chartered Institution of Building Services Engineers – Hong Kong Branch and I am extremely honored to be the Chair of the Organizing Committee of the Anniversary Dinner in this year. The CIBSE HK Branch Annual Dinner is one of the most important annual events which acts as an excellent platform for professionals from various trades and industries to meet with each other and share their views.

On behalf of the Organizing Committee, I would like to express my heartfelt gratitude to all our honorable guests, members, practitioners and generous sponsors from places near and far to attend and support this celebration for the 40<sup>th</sup> Anniversary of CIBSE Hong Kong Branch. Special thanks must be given to all OC Committee Members and many helpers who have helped to organize this event and publish the 40<sup>th</sup> Anniversary Brochure down to the finest details. The dinner will not succeed without all their kind support and contribution. In addition, I hope you enjoy reading the 40<sup>th</sup> Anniversary Brochure and learning about the rapid development of building services engineering in Hong Kong in past 15 years. CIBSE HK Branch played an important and leading role in its sustainable development.

My special gratitude goes to the founding members of the Hong Kong Branch who started its history in 1979 and to all those who have served and helped our branch to grow in the past 40 years.

Last but not least, I wish the CIBSE Hong Kong Branch will continue to flourish and promote the art, science and practice of building services engineering for the benefit of all stakeholders in Hong Kong, and advance the building services engineering through education and research in the coming years.

Thank you all once again for attending the dinner. I wish you all have an enjoyable Anniversary Dinner tonight!

A handwritten signature in black ink, appearing to read 'R. Chan'.

**Dr. Raymond Chan K.L.**  
Organising Committee Chair,  
CIBSE HK Branch 40<sup>th</sup> Anniversary

# CONGRATULATORY MESSAGES



Ir Ringo Yu Shek-man  
President, The Hong Kong Institution of Engineers

賀英國屋宇裝備工程師學會

香港分會四十周年

業界英才  
齊創新猷

香港工程師學會會長  
余錫萬工程師

# CONGRATULATORY MESSAGES



**Mr. Joe Eddie Wu Chou-kit**  
Chairman, The Macau Institute of Engineers

On behalf of The Macau Institute of Engineers (AEM), I am pleased to express my warmest and greatest congratulation to The Chartered Institution of Building Services Engineers Hong Kong Branch (CIBSE HK Branch) on its 40<sup>th</sup> Anniversary.

May I wish CIBSE HK Branch a joyful anniversary and every success in the coming years.

**Joe Eddie Wu C.K.**  
Chairman  
The Macau Institute of Engineers



# CONGRATULATORY MESSAGES



**Ir Brian Cheng Wai-lung**

Chairman, The Hong Kong Institution of Engineers –  
Building Services Division

On behalf of The Hong Kong Institution of Engineers – Building Services Division, I am delighted to offer my congratulation to the CIBSE (HK Branch) on their continual success into the 40 years in Hong Kong, I would also like to take this opportunity to express my appreciation toward the professionalism, commitment and achievement made by the CIBSE (HK Branch).

May I sincerely wish the CIBSE (HK Branch) and its members every success in the 40<sup>th</sup> Annual Dinner and in all future endeavors.

A handwritten signature in black ink, appearing to read 'Brian Cheng W.L.', written in a cursive style.

**Ir Brian Cheng W.L.**

Chairman (Session 2018 – 2019)  
The Hong Kong Institution of Engineers -  
Building Services Division

# CONGRATULATORY MESSAGES



**Mr. Wong Shu-hung**  
President, ASHRAE Hong Kong Chapter

On behalf of ASHRAE Hong Kong Chapter, I would like to congratulate the 40<sup>th</sup> Anniversary of CIBSE HK Branch.

For the past 40 years, the CIBSE HK Branch has made a valuable contribution to the professional development of building service engineering in Hong Kong, Hong Kong has become a modern city with sophisticated engineering support. It provides a fast and reliable network contributed by building service industry in Hong Kong, that all of us can enjoy the benefits generated from it. The contribution from CIBSE HK Branch is obvious.

CIBSE HK Branch has also established a very strong cross-industry platform for related professionals for collaboration and exchange of technological knowledge in the community.

With the strong leadership, CIBSE HK Branch will achieve new heights in the years to come.

A handwritten signature in black ink, appearing to read 'Wong Shu Hung'.

**WONG Shu Hung**  
President (2018-19)  
ASHRAE Hong Kong Chapter

# CONGRATULATORY MESSAGES



**Mr. Syed Mubarak**  
President, ASHRAE Macao Chapter

On behalf of ASHRAE Macao Chapter, I would like to convey our heartiest congratulations to CIBSE Hong Kong Branch on its successful 40<sup>th</sup> year anniversary celebration. It is indeed a great moment to acknowledge CIBSE HK Branch's excellent contributions and achievements over the years in the areas of green initiatives, smart buildings, energy efficiency, sustainability, healthy and safe working-built environment, training and development, knowledge sharing and engagement programs with other professional organizations to the benefit of the community.

I am very honored to be invited to the celebration of this auspicious moment and look forward to the continued partnership with CIBSE HK Branch towards long term contributions to the community in the many years to come.

Once again, congratulations and best wishes to CIBSE HK Branch!

Kind Regards

A handwritten signature in black ink, appearing to be 'Syed Mubarak', written over a white rectangular background.

**Syed Mubarak**  
President  
ASHRAE Macao Chapter

# CONGRATULATORY MESSAGES



**Mr. Alpha Chu**

CIBSE HK Branch Shanghai Panel Chair

I knew CIBSE by joining a technical talk when I was an university student. Since then, I began to join more activities organized by the CIBSE HK Branch and to learn more about the building services industry. The HK Branch linked up me with the CIBSE and widened my horizon in building services engineering. In the past 40 years, I believe the CIBSE HK Branch had done a great job on bonding numerous students, youngsters and experienced engineers together with CIBSE, and provided strong supports to their professional developments. The CIBSE HK Branch is also keen on supporting the CIBSE members at the mainland China. With the leadership of the CIBSE HK Branch, the Shanghai Panel organized technical seminars in Shanghai to promote CIBSE and strengthen the communication with members and local engineering societies. On behalf of the Shanghai Panel, I congratulate HK Branch's great success in the past 40 years. CIBSE HK Branch's contributions of promoting CIBSE and cultivating good engineers in the region are remarkable, I take this opportunity to express my gratitude to the CIBSE HK Branch.

**Alpha Chu**

CIBSE HK Branch Shanghai Panel Chair

# CONGRATULATORY MESSAGES



**Mr. Tony Lam**  
CIBSE YEN HK Chair

On behalf of CIBSE Young Engineers Network (YEN) HK, I am delighted to extend my warm congratulation to the CIBSE HK Branch on its 40<sup>th</sup> Anniversary.

I would like to take this opportunity to express our appreciation and thanks to CIBSE HK Branch for their continuous support on the development of CIBSE HK Branch YEN.

Once again, wish the CIBSE HK Branch continuing success in the future endeavours and prosperous development.

A handwritten signature in blue ink, appearing to read 'Tony Lam'.

**Mr Tony LAM**  
CIBSE YEN HK Chair

# CONGRATULATORY MESSAGES



**Prof. Asif Usmani**

Head, Department of Building Services Engineering  
The Hong Kong Polytechnic University

On behalf of the Department of Building Services Engineering (BSE) at The Hong Kong Polytechnic University (PolyU), I would like to congratulate to our partner The Chartered Institution of Building Services Engineers Hong Kong Branch (CIBSE HK Branch) on the occasions of the 40<sup>th</sup> Anniversary celebrations.

BSE, PolyU has a long history of collaboration with CIBSE HK Branch in the development of education and research in Building Services Engineering. We recognise and appreciate the strength and commitment of CIBSE HK Branch in its offerings of a wide range of learned society activities and promoting the art, science and practice of building services engineering for the benefit of all.

On this very special occasion, I would like to wish the 40<sup>th</sup> anniversary celebration of CIBSE HK Branch a fruitful and memorable event, and members of CIBSE HK Branch continued success in their future endeavors.

BSE looks forward to a future of continued collaboration with CIBSE HK Branch.

**Prof. Asif USMANI**

Head, Department of Building Services Engineering  
The Hong Kong Polytechnic University

# HISTORY ON THE FORMATION AND MILESTONES OF THE CIBSE HK BRANCH

## An Unofficial Bibliography of The Development of The Hong Kong Branch

Philip Chan  
CIBSE HK Branch Council of Management  
CEng, FCIBSE

### The First 25 Years of the Hong Kong Branch

The Chartered Institution of Building Services Engineers was established in UK by the merger of two older professional institutions – Institution of Heating and Ventilation Engineers and Illumination Engineering Society in 1976.

In January 1979, Hong Kong Branch was eventually formed and the office bearers of the inaugural year were Ian Phillis – Chairman, Samuel Wong – Honorary Secretary and Andrew Shillinglaw – Honorary Treasurer.

Due to various reasons, the Hong Kong Branch was dissolved in 1992 and the general members in Hong Kong were looked after by the Hong Kong Advisory Panel until 1998 when the Panel took the initiative to propose re-establishment of the Hong Kong Branch. The proposal for reformation of the Hong Kong Branch was endorsed in principle by the Headquarters in November 1998 and the new Hong Kong Branch commenced its operation from December 1998.

The membership size of Hong Kong Branch grew in the first 25 years from around 100 in 1979 to 2,500 in 2004.

### Permanent Establishment of the Hong Kong Branch

The operation of Hong Kong Branch was in form of a learned society under the umbrella of the Headquarters. The Hong Kong Branch was operated without permanent establishment in early days. The postal correspondence was mailed to a PO Box at Causeway Bay until the reformation of the new Hong Kong Branch in 1998. It was the kindness of our Immediate Past President – Peter Wong to let the Hong Kong Branch use his company address at 5 Tai Yuen Street as the Hong Kong Branch's correspondence address.

With the development of the Hong Kong Branch membership size and level of members activities, the need for a formal company registration becomes imminent. The idea of setting up a registered operating company for Hong Kong Branch was raised by our Past Chairman Ir Victor Cheung in 2003 and subsequently endorsed by Headquarters for proceeding to preparation of M&A for the company registration. The

Hong Kong Branch had its business registration and incorporation as a Charity in January 2005.

Having the formal business registration in place, a local secretarial office serving Hong Kong members would be the next goal. Setting up a local secretarial office was, however, driven by the Headquarters. The Headquarters intended to having a joint secretarial office in Hong Kong with another professional institution as a start. After discussions in UK, the Headquarters decided that the initial local secretarial office would share the office space with Royal Institute of Chartered Surveyors situated at Central Plaza Wanchai. The secretary of our local secretarial office was subsequently recruited in October 2006. The Secretarial Office was then officially opened by the CIBSE President David Hughes and CIBSE President Elect John Armstrong on 18 November 2006.

Since then, our Hong Kong members are served by the Secretariat for all the activities of the Hong Kong Branch.

### Communication with Members

Nowadays, emails and web information are used as daily communication medias. But 20 years ago, the IT communication had just started and the setting up of web site and hosting of web information were quite tedious.

The Hong Kong Branch had set up our own web site [cibse.org.hk](http://cibse.org.hk) some twenty years ago. At that time, the domain name registration, the domain name hosting service and the web information hosting service were under different arrangements.

Without permanent establishment in early days, the domain name of Hong Kong Branch was hosted at City University DNS server under a pilot project funding of the university while the web information of Hong Kong Branch was hosted at Hong Kong Polytechnic University server through the University's Building Services Engineering Department and the current website was wholly revamped in 2016.

In September 2002, the Hong Kong Branch had formalized the domain name registration and registered the domain name [cibse.org.hk](http://cibse.org.hk) with Hong Kong Domain Name Registration Ltd. Under the proper web domain, a new CIBSE Hong Kong Branch web site was launched in January 2004, and the current website was wholly revamped in 2016. Since then, the Hong Kong Branch published regular e-newsletters and uploaded photos/ reports onto the new Hong Kong Branch web site such that the general members are able to know more about the activities and services offered by CIBSE. The Hong Kong Branch has further utilized the social networking web site to communicate with the general members – the CIBSE Hong Kong Branch Facebook account was opened in March 2018.

# HISTORY ON THE FORMATION AND MILESTONES OF THE CIBSE HK BRANCH

## Development of Hong Kong Branch Operational Structure

Since the reformation of Hong Kong Branch, its organizational structure had undergone a number of significant changes. The committee of the Hong Kong Branch was formed by electing building services engineers from different backgrounds and sectors as committee members. Initially, the committee comprised 12 committee members including Chair, Immediate Past Chair, Vice Chair, Honorary Secretary, Honorary Treasurer and 7 other committee members. Each committee member was assigned specific duties for various functions, e.g. communication, government liaison, training, etc. Past Chairs were invited to serve as Honorary advisors to the committee to provide advices for major issues in the operation of the Hong Kong Branch.

When the Hong Kong Branch was incorporated in January 2005, the operation of Hong Kong Branch was changed to two tiers management system – Council of Management formed by representatives of the Headquarters and Branch Committee elected from local members. The Council of Management will review and endorse proposals submitted by the Branch Committee related to the formation of branch committee, any change in branch rules and the annual return of the Hong Kong Branch. On the other hand, the Branch Committee will take care of the general members' learned society activities. The Council of Management consists of four councillors, two of them are officers of CIBSE Headquarters and another two are elected from Past Chairs.

The membership size of Hong Kong Branch grows from 100 in 1979 to 2,500 in 2004 and then to around 2,800 in 2015. There was a need to expand the Branch Committee to better serve the general members in Hong Kong. As such, the proposal to increase 1 additional committee member was endorsed by the Council of Management and the Hong Kong Branch Committee has been expanded to 13 committee members.

In order to promote building services engineering as a preferred profession to younger generations, a sub-committee called "Young Member Group (YMG)" was formed in 2001 to facilitate the linkage between the Hong Kong Branch and the building services students and graduates. This new sub-committee was initially positioned as interest group under the Hong Kong Branch aiming to cater for the needs and interests of the general members of any class who were below 35 years of age. After some years of operation, it had been decided that the YMG should have a better linkage with the activities of the Headquarters. As such, the YMG had been reformed and renamed as Young Engineer Network (YEN) in June 2010 to align with the corresponding sub-committee in UK.

## Participation in CIBSE International Initiatives and Functions

The operation of Hong Kong Branch in early days mainly focused on local members' interests. After the reformation of the Hong Kong Branch, the Headquarters started to promote membership in Mainland China. It was started with some linkages with Nottingham University Ningbo Campus and the Joint Office of UK Professional Institutions (PIUK) at Shanghai. These linkages and collaborations led to discussions for a strategic plan for development of CIBSE membership in China. The idea of setting up a Shanghai Panel affiliated to the Hong Kong Branch was introduced with an aim to promote CIBSE membership and serving the members in Mainland China, and eventually a task force for Shanghai Panel was formed in March 2009. This initiative was further developed and the Headquarters has finally endorsed the setting up of Shanghai Panel in 2012.

With one-seventh members of CIBSE based in Hong Kong, the voice of having representation at the CIBSE UK Board become louder. Past Chairman Ir KO Yeung stood for and won the election of Board Member in 2006, being the first UK Board Member from Hong Kong. Our representation at UK Board was succeeded by the Past Chair of Hong Kong Branch Ir Peter Wong. He had been elected as Vice President in 2011 and President-Elect of CIBSE in 2016 and became the President of CIBSE in 2017. Dr PL Yuen maintained the continuation of our representation on UK Board by winning the election as Board Member in 2018.

## What is the Next Move?

In last 40 years, the Hong Kong Branch is developed from a small team of 3 committee members to a properly sized committee of 13 committee members. The Hong Kong Branch has been equipped with proper IT facilities, international connections and building services professionals with world class project experience. It will be the time for Hong Kong members and Hong Kong Branch to share our valuable experience with other members of the Institution for the advancement of building services engineering science.

The Hong Kong Branch committee should aim to reinforce and broaden our technical position, both in the Hong Kong and internationally. By building up our knowledge and technical expertise, we should aim to extend our influence with government policies on issues related to built environment, climate change and energy efficiency.

The membership size of Hong Kong region has been maintained at a significant portion of total members of the Institution over the last decade. The organization structure of the Hong Kong Branch should be reviewed regularly to ensure that the committee will be appropriately resourced to address the needs of the industry arising from time to time as well as the required services to the general members in Hong Kong.



# THE DEVELOPMENT OF BUILDING SERVICES ENGINEERING IN HONG KONG

When CIBSE Hong Kong Branch came to the Silver Jubilee in 2004, we invited few experienced building services engineers to publish two papers at the Anniversary Brochure. They are Ir Raymond K.S. Lin and Ir K.F. Lau for “Review of Building Services Development in Hong Kong” and Ir Albert P.K. Kwok for “The Development of Building Services Engineering in Hong Kong”. These two papers provided very useful information about the development of building services engineering in Hong Kong up to 2004.

Over past decades, building services engineering have advanced quickly in terms of life-cycle design approaches, construction methodology, operation and maintenance strategy, in order to meet the rising expectation for better services quality, comfort, safety, healthy environment, and sustainability. The fast development in new technologies and digitalization also accelerated the advancement of the industry in recent years. Taking the opportunity in this 40th Anniversary of CIBSE Hong Kong Branch, we would like to take a brief review on the latest development of building services engineering particularly in Hong Kong on the following categories: HVAC, Fire Services, Plumbing & Drainage, Electrical and Lighting, Lift & Escalator, and Digitalization.

# THE DEVELOPMENT OF BUILDING SERVICES ENGINEERING IN HONG KONG

## HVAC Development in Hong Kong

C.M. Chung, Director, J. Roger Preston Ltd., CEng MCIBSE

John Chan, General Manager, Trane Hong Kong, CEng MCIBSE

### Introduction

Hong Kong, a high densely populated city, is located in a subtropical region where summers are hot and humid. HVAC plays an important role among people's daily life and has been widely used in Hong Kong nearly a century. Starting simply with providing comfort cooling only in Hong Kong, the industry has been evolving to sophisticated systems providing a comfortable, safe and healthy indoor environment with high energy efficiency and sustainability.



### Evolution

Air-conditioning system was first introduced in Hong Kong in 1930s and in the early stage, its application was mainly in public places, such as cinemas, offices and hospitals. Its application was not widely adopted in the commercial buildings not until 1960s. In order to provide a comfortable indoor environment, the first MTR line was air-conditioned in 1979. Nowadays, commercial hubs in this city are characterized by iconic super high-rise towers in which efficient and intelligent HVAC systems are indispensable part of the building design.

Producing cooling in modern buildings has been unable to fulfill the expectation of general public, especially in hospitals or laboratories where there is stringent requirement with regard to environmental and contamination/infection control. The development of air-conditioning system in hospitals dated back at the end of 1930s when Queen Mary Hospital and Kowloon Hospital were constructed. Traditionally the design of the HVAC systems in the health care buildings follows the international guidelines such as CIBSE Guide, Hospital Technical Memorandum (UK) and ASHRAE standards. To combat the SARS attack in 2003, the SARS

Buster team, with CIBSE HK Branch as one of the task force members, was formed to review the traditional HVAC systems design in the isolation facilities. Based on this collaborative effort of the local engineering professionals and academia, an effective design solution was developed and has been adopted in the new isolation facilities in Hong Kong. With increasing awareness of the importance of indoor air quality, measures such as UV-sterilization, bio-oxygen generator and desiccant dehumidification have been introduced in recent years.



### Sustainable Move

In millennium (2000s), the concept of green and sustainable building was proposed for achieving better energy saving and less environmental impact. Green building certification such as BEAM Plus and LEED are also driving for rapid changes in the industry. For energy efficiency aspect, except for the variable air volume (VAV) since 1980s, variable speed drive (VSD) had become a mature technology which had been widely adopted in motors for compressor, fan, AHU and pump. Traditional chillers with Constant Speed Drive (CSD) compressor focused on the most efficient performance at peak load but not part-load conditions. With the advancement of VSD & oil-free compressors, new air-cooled chillers and water-cooled chillers are then developed for high performance at part-load conditions with less vibration and less noise. In recent years, further energy saving can also be achieved by control methods, such as Variable Primary Flow (VPF) & Cooling Tower Optimization (CTO). Heat pumps and heat recovery chillers are also widely adopted since 2000 in hotels and hospitals where there is high demand of space heating to reduce the

# THE DEVELOPMENT OF BUILDING SERVICES ENGINEERING IN HONG KONG

energy consumption of the HVAC systems significantly. Energy conservation approaches such as free cooling, heat recovery, demand controlled fresh air supply are becoming norm in modern buildings to further enhance the overall energy performance.

Apart from other traditional building based air-cooled and water-cooled chillers plant, District Cooling System (DCS) is a large scale centralized air-conditioning system to utilize sea water to produce chilled water at the central plants and distributes the chilled water to consumer buildings through underground water piping network in a district. The first one in Hong Kong is the DCS system at Kai Tak Development commenced in 2013 and all phases are expected to complete by end of 2025 with a full capacity of 284 MW.



## Government Policies

The Government of HKSAR always plays a leading role in promoting energy efficiency of HVAC. In 1998, the Electrical & Mechanical Services Department (EMSD) launched a Pilot Scheme for Wider Use of Fresh Water in Evaporative Cooling Towers for Energy-efficient Air Conditioning Systems in May 2000. This “Fresh Water Cooling Towers Scheme (FWCT Scheme)” recommends replacing air-cooled chillers by high Coefficient of Performance (COP) water-cooled chillers for achieving the most energy saving of Chiller plant. Its status was changed from pilot to standing since 2008. The recent reviewed version was completed in December 2016. Besides, EMSD launched the voluntary “Hong Kong Energy Efficiency Registration Scheme for Building” since 1998 to promote and arouse public awareness of energy efficiency. Subsequently, in 2012, the mandatory implementation of the Buildings Energy Efficiency Ordinance (BEEO) was adopted by the government as one of the government initiatives to combat climate change.

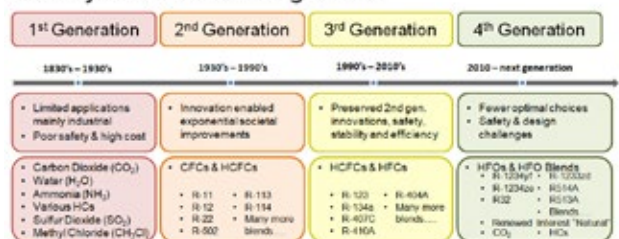
## Green Refrigerants

In response to the Montreal Protocol in 1987 when first addressed a global issue on Protecting Ozone Layer, a new “Ozone Layer Protection Ordinance” was enacted by Hong Kong Environmental Protection Department

(EPD) in 1989, which aimed to limit the use of Ozone Depletion Substances (ODS) and ultimately banned it on 2020. It changed the refrigerant related HVAC industry.

Nowadays, the climate change becomes critical as global warming created natural disaster and crisis that will definitely affect our next generations. Based on Kigali Amendment to Montreal Protocol addressed Global Warming, thank for the effort of chemists and engineers, new generation refrigerants are invented with ultra-low GWP (<2) and non-Ozone Depletion Substance. Next generation refrigerants dramatically changed the industry in term of impact of both Global Warming (HFC refrigerants has its GWP over a thousand) and Ozone Depletion Potential (ODP). These next generation refrigerants in air-conditioning systems can definitely help hitting the target of “Hong Kong’s Climate Action Plan 2030+”, which was announced by Hong Kong Environment Bureau in 2017 to fulfill the requirement of Paris Agreement 2016 succeeding the Kyoto Protocol for driving the carbon emission reduction.

### History of HVAC/R Refrigerants



## Towards a Smarter Future

Benefit from the exponential growth of computing technology and IT, it is now the time for HVAC system entering into another high “digitalization age”. Building Automation and Control (BAC) system has moved from fixed telephone line to high speed data network with open protocol allowing interoperability across multiple systems. Through BAC or building management systems (BMS), all the operating parameters from machines and systems will be digitized and stored into the internet cloud as big data for use as city planning and energy analysis. Moreover, with the upcoming wider application of BIM and DfMA / MiC in the local construction industry, we look forward to significant improvement in the quality, productivity and cost-effectiveness of the installation of HVAC systems with enhanced site safety and sustainability.

It is no doubt that HVAC engineers in Hong Kong are playing a key role in providing us a better indoor environment and ensuring a sustainable future for our next generation.

# THE DEVELOPMENT OF BUILDING SERVICES ENGINEERING IN HONG KONG

## Fire Engineering Development in Hong Kong

Keith W.H. Ma, Managing Director, Meinhardt (M&E) Ltd., CEng FCIBSE

Hansel Han, PhD; Martin Wan, CEng MCIBSE & Boris Tang, CEng

### Introduction

In earlier years, building designs would fully comply with the requirements specified in the prescriptive fire codes. Hong Kong being one of the world's densest cities, there has been a great demand for high-rise building design and deep basement structures featured with huge atrium. Additionally there were a series of infrastructure projects driven by the Airport Core Programme during the early 1990s and theme park facilities during the early 2000s. These skyscrapers, transportation hub and amusement ride facilities gave challenges to the architects and engineers to design the buildings in full compliance with the prescriptive fire codes including the Code of Practice for the Provision of Means of Escape in Case of Fire, the Code of Practice for Fire Resisting Construction and the Code of Practice for Means of Access for Firefighting and Rescue stipulated by Buildings Department (BD).

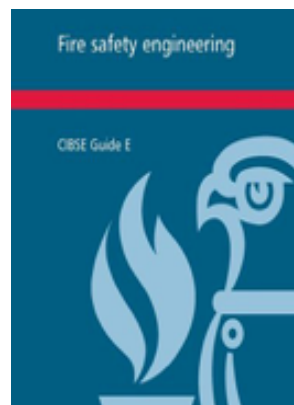
Consequently performance-based design also known as "fire engineering approach" was accepted by the local authorities as an alternative solution to building design in 1990s, one of the first buildings adopting fire engineering approach was the Hong Kong International Airport at Chek Lap Kok.

At the same time, the rapid advancements in fire science and fire safety engineering practice have greatly promoted the fire engineering development. In response to the growing demand for Building Services Professionals to face the new challenges, The Chartered Institution of Building Services Engineers (UK) published the first edition of Guide E – Fire Safety Engineering in 1997 and updated to third edition in 2010 to take account of the latest research, legislation and publications. This Guide provided a solid reference to the practicing designers, building services engineers, fire engineers, authorities and students embarking on the professions

related to fire safety.

Meanwhile, the Hong Kong Institution of Engineers (HKIE) established the Fire Discipline in November 2005 and subsequently formed the Fire Division in June 2008.

In 2011 Buildings Department issued the Code of Practice for Fire Safety in Buildings on the basis of the consultancy study on fire engineering approach and fire safety in buildings. This code provides guidance on compliance with the requirements laid down in the Building (Construction) Regulation 90 and the Building (Planning) Regulations



41, 41A, 41B, 41C and 41D, which include the requirements for fire resisting construction, means of escape and means of access for firefighting and rescue to buildings. As the Authority has recognized that fire safety may be achieved in an alternative approach and this is particularly pertinent to buildings where there are genuine difficulties in complying with the Deemed-to-Comply provisions because of their size, use, complexity or location, Part G of this code provides guideline to carry out fire engineering to an acceptable standard with reference to various international guidelines including CIBSE Guide E.

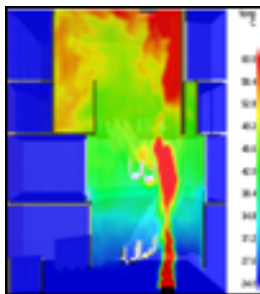
### Fire Engineering Methodology

Fire engineering is the application of engineering principles, rules and expert judgment based on a scientific appreciation of the fire phenomena, of the effects of fire, and the reaction and behaviour of people in order to protect the life and property. Empirical formula and zone fire model for fire dynamics have not been the only tool adopted in fire engineering predictions, computational fluid dynamics (CFD) and evacuation computer models have been widely used in the fire safety assessment since 2000. By utilizing CFD

# THE DEVELOPMENT OF BUILDING SERVICES ENGINEERING IN HONG KONG

simulation and evacuation modeling, tenability conditions in a fire incident can be assessed and the design can be validated. Tenability is generally assessed in terms of visibility, local air temperature, the radiant heat flux from the fire and hot smoke layer, and the toxic gas level based on CFD simulations. The CFD modeling may also form part of the risk analysis study in conjunction with structural fire response and evacuation simulations.

In order to complete a performance-based assessment, acceptance criteria must be developed for analyzing the outcome of the design. The relationship between the acceptance criteria and the relevant performance requirements may vary in different scenarios and must be considered on a case-by-case basis and “Equivalent level of fire safety” is always the baseline performance for assessing the fire safety level



CFD modeling



Evacuation Simulation

achieved by fire engineering approach. Apart from quantitative analysis, qualitative analysis which is using the engineering judgment with documented reasoning and arguments to compare fire engineering approach against the Deemed-to-Comply provisions may also be required in some cases.

## Fire Service for Fire Engineering Approach

With fire engineering development, new fire services installation requirements have been introduced and accepted by the industry and authorities such as fire curtain/shutters have been widely used as an alternative approach for fire compartmentation, fast response sprinkler has been widely accepted as an enhanced provision for active fire protection and long-throw sprinkler system has been adopted to effectively protect high ceiling areas. Intelligent fire detection technologies such as flame detection systems and aspirating smoke detection systems for identifying and

reacting to fire situations in their earliest stages have been developed to facilitate early fire suppression, smoke control and the overall fire safety management strategy.



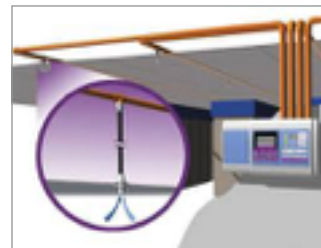
Fire curtain



Long-throw sprinkler



Flame detector



Aspirating Smoke Detection

## The Way Forward

To promote the sustainable development of the fire engineering, it is very important to enhance the collaborations between authority, research institute, consultant, decision-maker and stakeholders. CIBSE Guide L – Sustainability published in 2007 sets out the fundamental principles which, when followed, will deliver more sustainable buildings. Involvement of fire engineers at the earliest stages of planning, generally at the feasibility or concept design stage could benefit the building. By influencing key decisions at an early stage, fire engineers can play a major role to provide strategic input on sustainability issues early in the planning and design process for a comprehensive fire and life safety whole building design.

## Plumbing and Drainage Engineering Development in Hong Kong

Tommy T.C. LEUNG, Technical Director, WSP (Asia) Ltd., CEng MCIBSE

### Introduction

Over the past decades, Building Services Engineers have been working closely with government departments and various stakeholders in the plumbing and drainage industry in response to the public concern on water safety, sanitary health, anti-flooding provision and sustainability. The efforts made on these fronts are summarized below.

### Water Safety

The problem of lead contamination of drinking water broke out in 2015 due to use of improper soldering materials for water supply pipework installation. Building Services Engineers worked with Water Supplies Department (WSD) to uphold water safety by exploring new piping materials / jointing methods, strengthening the control on plumbing materials and tightening the commissioning requirements for new plumbing installations.

Copper pipe was commonly used for potable water supply after WSD prohibited the use of Galvanized Steel pipe in 1995 due to aging and corrosion of Galvanized Steel pipe which would affect water quality. After the break out of lead contamination problem, Building Services Engineers started to explore new piping material such as stainless steel to avoid heavy metal contamination for drinking water. In addition, application of alternative pipework jointing methods such as press fit and push fit pipe jointing method have also been studied. Both of these jointing methods are mechanical type and not requiring welding thus not only avoiding misusing of improper welding material but also improving the installation efficiency.

WSD implemented more stringent control measures on General Acceptance (GA) system which pre-approved plumbing products progressively since 2015 which including;

- impose 5 years validity period of GA,
- expand the GA list to cover more pipework materials and accessories,
- introduce voluntary GA\* Scheme to promote adoption of low metal leaching rate metallic plumbing products in fresh water, and
- launch surveillance programme to spot check the plumbing products with GA by verification test

In addition, more stringent commissioning requirement has been set up for 6-hour stagnant water sample test including 6 heavy metals to meet World Health Organization (WHO) drinking water standards.



WSD will take six-hour stagnation water sampling test results as the commissioning requirements

### Sanitary Health

SARS in 2003 had alerted Building Services Engineers the importance of enhancement of Sanitary Health provision. Over the last 15 years, Building Services Engineers have adopted the following measures to address public concern on Sanitary Health.



Pre-mature rusting of cast iron pipe without proper access for inspection and maintenance

Traditional Cast Iron pipe used for drainage installation has presented pre-matured rusting and leakage which is unsatisfactory from health and environmental hygiene point of view. Cast Iron with proper anti-rusting painting on pipe surface and internal epoxy pipe lining was commonly adopted for drainage pipe. In addition, to avoid drying up of the water seals of kitchen and toilet floor drains, priming pipe will be provided to divert some of the waste drain from basin or kitchen to refill the water seal. Proper inspection, repair and maintenance of drainage pipework are also essential. New requirements are set out for planning and design with proper access to drainage installations including all drainage pipes shall run in common space and shall not protrude into floor below under separate occupancy. Drainage pipe duct shall also be accessible from common areas to allow visual inspection for the external drainage pipes enclosed by external architectural features.

### Anti-Flooding

Owing to the climate change, super typhoons Mangkhut and Hato attacked Hong Kong in the past

# THE DEVELOPMENT OF BUILDING SERVICES ENGINEERING IN HONG KONG

2 years. Some seaside developments suffered from serious flooding in particular at the basement floors causing damage of the essential building services equipment as well as the properties and vehicles. As a result, suspension of power supply, water supply and lift services had seriously affected the daily life of the residents. Since then, Building Services Engineers have started to review the anti-flooding provisions including identifying the possible flooding level, locating the essential building services equipment above flooding level, preventing back flow from utilities lead in, allowing redundancy storm water drainage discharge network, and provision of flood gates / boards for building entrance below flood level etc.



Typhoon Mangkhut officially Hong Kong's most intense storm since records began



Underground car park was completely flooded

## Sustainability Design

### Water Conservation

While Hong Kong enjoying a stable water supply and fairly low water tariff which have not been adjusted since 1995, our domestic per capita water consumption is around 210 liters / day which is higher than many other global cities. Various water conservation initiatives are promoted to save the fresh water which will also reduce the sewerage discharge loading and treatment cost.

### Flushing / Grey Water

Hong Kong is a world class city utilizing seawater for toilet flushing and saving fresh water to serve for other purposes. The flushing water network has been expanding in the past years and currently cover about 80% of the total population in Hong Kong.

Grey water is the collection of waste water discharged from wash basins, showers, baths, laundry machines and air conditioning condensate which is then treated and reused for non-potable purpose. Currently, seawater is commonly used for flushing purpose to save majority fresh water consumption for non-potable purpose. However, it is difficult to expand the flushing network in the future development at North West New Territories which are far from the sea. Utilization of grey water shall be considered to replace seawater for flushing and other purpose such as floor washing, irrigation,

firefighting etc. A Pilot project at Tseung Kwan O has been completed in recent years with central grey water supply system installed to serve for district park irrigation, water features and general cleaning.

### Water Efficiency Labelling Scheme (WELS)

WELS intends to cover the common types of plumbing fixtures and water-consuming devices including showers for bath, taps for kitchen sink and wash basins, urinal flushing valves, water closets and washing machines. Products participating in WELS will incorporate a water efficiency label that will tell the consumers the level of water consumption and water efficiency and help consumers to choose water efficient products for water conservation.

WELS has been commenced since 2009 and currently it is mandated to use WELS products of showers, taps and urinal flushing valves for the kitchens of domestic premises and bathrooms, toilets of all premises.



Water efficiency labels

### Water Main Leakage

Hong Kong has over 8,000 km of water mains and due to aging problem, we are facing water main leakage problems. To control and mitigate the water leakage, the Water Supplies Department (WSD) has started to implement water mains pressure control by reducing the town mains minimum pressure from 20m to 15m since 2018 and indirect town main supply shall be adopted for all buildings with building height exceeding 12m. In addition, sub-check meters will be provided for large development with extensive buried internal water distribution mains to ensure prompt detection of water loss due to leakage.

## The Way Forward

Over the years, Building Services Engineers have contributed to the society in different aspects, including the development of new plumbing and drainage system provisions for a better living environment and robust measures for tackling the challenges of climate change, public health issues and conservation of water resources. In future, Building Services Engineers shall maintain our momentous effort and apply the latest technologies to meet the needs of the Hong Kong Society, such as using Building Information Modeling (BIM) to develop the installation methods for efficient environmental friendly Modular Integrated Construction (MiC) and, applying information technology to improve the operation efficiency and reliability of plumbing and drainage equipment operation for water loss mitigation and minimization of water consumption.

## Lighting and Electrical Systems' Development in Hong Kong

T.M. Chung, Retired Professor, Department of Building Services Engineering, Hong Kong Polytechnic University, CEng FCIBSE

### Introduction

Development of lighting and electrical installations in the last two decades has been in directions of enhancing occupant safety and comfort and leading to higher energy efficiency since the launch of the voluntary building energy efficiency registration scheme in 1998. This paper gives a brief account of the development of building lighting and electrical systems in Hong Kong in the period roughly covering the past 15 years.

### Building Energy Codes for Lighting and Electrical Installations

The first building energy code in Hong Kong was the Code of Practice for Energy Efficiency of Lighting Installations published in 1998. A year later, the Code of Practice for Energy Efficiency of Electrical Installations was published in 1999. During the past 15 years, these codes were revised five times: in 2005, 2007, 2012, 2015 and 2018. Before 2012, the building energy codes were used for the voluntary Hong Kong Energy Efficiency Registration Scheme for Buildings. The Building Energy Efficiency Ordinance was enacted in 2012 and building energy codes for the four building services installations were combined into one single building energy code. Since then, the building energy code has a revision every 3 years. The building energy code has significant influence on the development of building lighting and electrical systems in Hong Kong.

### Lighting Systems in Buildings

Before 2004, work place lighting was provided mostly by linear fluorescent lamps (mainly T8 halophosphate) with magnetic choke ballasts despite that from the late 1980s there were many lighting retrofit projects replacing magnetic ballasts by electronic ballasts and halophosphate lamps by tri-phosphor lamps of higher energy efficiency and better colour rendering. The T5 fluorescent lamps which use tri-phosphors and operate with only electronic ballasts entered the market in late 1990s. In the early 2000s, lighting retrofits and new lighting installations started to use T5 fluorescent lamps. In some projects, T5 high output lamps and induction lamps were used to replace metal halide and high pressure sodium lamps used in high bay installations such as indoor sports halls. Light emitting

diode (LED) lighting products entered the market in the 2000s, but LED lighting was not used in significant proportion of new lighting installations and lighting retrofit projects until recent years due to much higher prices and the lack of standards. Since early 2000s, there have also been increasing use of automatic lighting controls such as occupancy sensors and daylight response controls for switching and dimming of lighting systems. Intelligent lighting controls have also been used in some applications.

Before 2004 a high proportion of residential lighting was provided by incandescent lamps, compact fluorescent lamps (CFLs) were used mainly in fittings designed for non-integral CFLs. During the 2000s, incentives were given by the government, power companies and major lamps manufacturers for the replacement of incandescent lamps by integral CFLs but the response was not too good. In 2013, the Hong Kong government launched a charter scheme for voluntary phasing out of incandescent light bulbs. It is now difficult to buy incandescent light bulbs which have disappeared in supermarkets and household stores. LED lighting products for residential use have been in the market from mid-2000s but due to the much higher prices residential lighting using LED were not common until about the mid-2010s. Price for LED lamps has reduced to a competitive level and even cheaper than CFLs recently. In late 2015, the Swedish furniture shop IKEA stopped selling CFLs and now sells only LEDs. General Electric stopped producing CFLs at the end of 2016. All these show that LED has been gradually penetrating into the residential lighting market and this trend is fast accelerating. Although still rare currently, home automation systems including smart lighting have begun to enter the residential market; these systems can manage the lighting on/off, dimming and colour tone from smart phones and tablets so that different lighting effects can be adjusted for different situations.



Gradual change of light bulbs for residential use: Incandescent to CFL to LED



# THE DEVELOPMENT OF BUILDING SERVICES ENGINEERING IN HONG KONG

## Electrical Systems in Buildings

In July 2007, the new cable colour code for identification of conductors in fixed electrical installations was implemented in Hong Kong. Since the launch of the mandatory building energy code, there have been tighter requirements for metering and monitoring facilities for central building services installation circuits. The metering requirements are important for the improvement in energy efficiency and power quality. Power quality management (PQM) with power metering is now applied in more and more buildings in Hong Kong. High voltage (11 kV) chillers are getting more popular in buildings so that step down transformers are not required and cables can be smaller with saving of space. Due to the increasing use of data communication equipment, computers, mobile phones, tablets, etc, there have been also increasing demands on extra low voltage direct current (DC) supplies in buildings. The inclusion of DC USB sockets in power outlets is getting more common recently, although the DC power in most of these DC supply outlets is converted from mains alternating current supply at the outlets. In recent years there has also been increasing number of charging facilities for electric vehicles (EV) installed in commercial and residential buildings in Hong Kong.

Since early 2000s, there has also been increasing number of renewable energy power systems installed in buildings; these are mainly solar photovoltaic (PV) systems, some of which are grid connected. EMSD published a Technical Guidelines on Grid Connection of Renewable Energy Power Systems in 2007 and a revised edition in 2016. Recently, the two power companies have launched Feed-in Tariff schemes to buy grid connected renewable energy power from residential and business customers.



A grid-connected PV system installed on a school building roof

## The Way Ahead

In order to enhance the safety, comfort and sustainability of the built environment, we will see building lighting and electrical systems further developed in directions of energy efficiency and reduction of carbon emissions. LED lighting systems will be used widely in buildings; intelligent lighting controls will also be more common to provide smart lighting systems. Renewable energy generated at the building location will also be more widely used to provide electric power for the building and to the power grid. In future, DC power distribution networks in buildings may become a good option in order to cater for the growing applications that require DC power, such as smart phones, computers, LED lighting and EV fast charging systems.



EV chargers installed in commercial and residential buildings

## Development of Elevator Industry in Hong Kong

H.S. Kuok, President, The Lift and Escalator Contractors Association

### Introduction

Elevator industry worldwide has experienced drastic changes in the past 15 years. There is a continuing trend towards GREEN elevator, which is related to not only energy consumption, but also the materials, processes, and technologies used. Yet energy efficiency remains one of the core features of an elevator. Apart from increasing the efficiency of the hardware of an elevator, its software is equally important. By observing and studying the irregular nature of elevator operation, periods of peak load, and low-load and empty trips, etc., elevator manufacturers are keen on innovating new energy consumption models that help to develop better management strategies.

### Energy-Efficient Hardware

#### Geared and Gearless Motors

High-rise buildings typically install geared or gearless traction elevators capable of high or variable speed operation. In geared machines, the electric traction motor drives a reduction gearbox of which the output turns a sheave over which the rope passes between the car and the counterweights. On the contrary, in gearless elevators, the drive sheave is directly connected to the motor, thereby reducing gear-train energy losses. Gearless motors save more energy than geared motors, and enjoy greater longevity because they feature higher torque and run at lower RPMs.

#### Machine-Room-Less (MRL) Technology

Saving highly valued construction space has always been a concern for elevator designers. Evolution in permanent magnet motor technology and motor drives allowed a significant reduction in the size and shape of these components which, in turn, made it possible to fit all the equipment directly into the elevator shaft. In the past, elevator equipment was so huge that a big machine room was crucial to be placed above the hoistway over a building's roof. The machine room was expensive owing to the need of supporting heavy machinery (Figure 1).

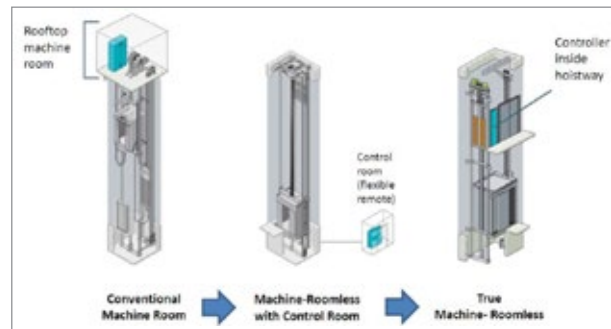


Figure 1. Gearless Machine-Roomless Revolution. This increases usable spaces, which is essential in skyscrapers.

Nowadays, the MRL system becomes even more energy efficient when it is combined with regenerative drives [1,2]. Nevertheless, a major drawback of the MRL design may increase the risk for the elevator mechanics to conduct the maintenance and repair works as machine, control panel, ventilation, etc., are all compactly installed at the topmost part of the elevator shaft.

#### Regenerative Drives

Regenerative drives represent one of the most significant innovations in the latest generation of energy-efficient elevator technology. For conventional elevators, the power generated by the traction machine is dissipated as heat by special heat resistors. Whereas, elevator with regenerative function obtains power from electrical supply network, when it travels downwards with heavily loaded (people weight > counterweight) or upwards with lightly loaded (counterweight > people weight), the traction machine will be act as power generator, converting mechanical energy to electrical energy. The regenerative drive captures that energy and diverts it back to the building or

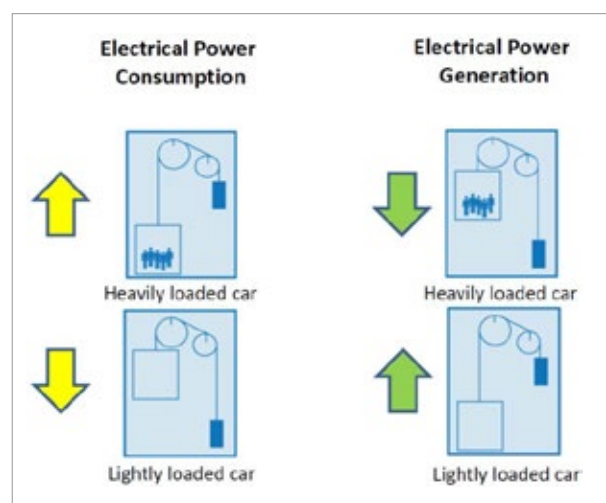


Figure 2. The regenerative drive system

# THE DEVELOPMENT OF BUILDING SERVICES ENGINEERING IN HONG KONG

the city power grid [3,4,5]. In fact, length of trips, frequency and pattern of use are the main elements for the final amount of energy savings

## Elevator Ropes

With the irreversible trend of super-high buildings all over the world, like Hong Kong, elevator ropes may stretch for too long, adding on much more burden which may lead to rope breaking or snapping. Very long ropes may also over sway and vibrate substantially when strong winds in typhoon time making buildings to sway. As a result, damage to the ropes is likely to happen.

In response to these problems, elevator manufacturers have been working on improving the rope capabilities. Ropes are being continued to innovate to be stronger, lighter and denser than the conventional steel rope. These stronger and lighter ropes are less sensitive to the building sway frequencies and they also require less energy to move and transport the elevator cabs, leading to significant power savings [6].

## Double Deck Elevators

Double Deck elevators are two cabins tall, with one cabin serves even-numbered floors and the other serves odd-numbered floors. Therefore, the total number of required elevators is greatly reduced. As skyscrapers are getting higher, it is necessary to reduce the number of elevators since they occupy valuable interior space on each floor.

Nowadays Double Deck elevators are combined with Destination Dispatching Systems in order to lessen passengers' dissatisfaction with transferring levels at the main lobby and due to non-coincident stops. Knowing each passenger's destination enables the system to allocate passengers to elevator decks and cars intelligently, enables passengers to catch their elevator service from either the upper or the lower lobby. This can improve the overall performance of the service and reduce non-coincident stops [7,8].

## The TWIN Elevator System

An innovative design of Twin elevator system was first launched for skyscrapers in 2016. The advantage of the TWIN is that two cabins run independently in a single shaft. The system keeps a safe distance between the two elevators (upper and lower cabins) that are running on top of each other.

The TWIN system basically provides savings in space as it cuts the number of shafts needed compared to conventional elevators, and thereby reducing construction cost in both labor and materials.

With TWIN, both cabins use the same guide rails and landing doors. Each cabin is equipped with its own traction drive, controller, ropes, counterweight and governor. Meanwhile, in order to reduce unnecessary waiting time and the number of stops, a destination selection control system can be equipped to direct passengers to elevator, and group passengers with same destination, in order to improve the traffic and energy efficiency in the building [9].

## Ultra-High-Speed Elevators

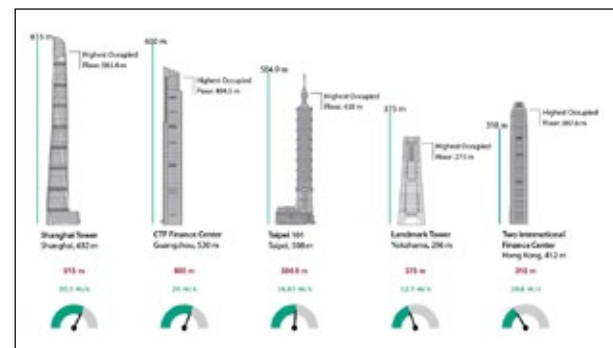


Figure 3. The World's 5 Fastest Elevator Installations

Elevator technology and skyscraper architecture have had a symbiotic relationship for more than a century, with improvements in one encouraging new developments in the other. According to the research study entitled "Vertical Transportation: Ascent & Acceleration" by The Council on Tall Buildings and Urban Habitat (CTBUH) in 2018 (Figure 3), the elevators in Shanghai Tower, China turn out with the fastest elevator speed, 20.5 m/s and the longest vertical runs, 578.55m in the world. It incorporates the technologies advancement features such as the traction motor incorporates a permanent magnetic motor for energy efficient, hydraulic driven clamp-type disk brake, advanced safety gear, super high-rise, stronger and less-stretchable wire rope, as well as new active roller guide [10]. In fact, The Two International Finance Centre in Hong Kong is also ranked the 5th fastest elevator speed at 10.6 m/s in the world record.

## Large-capacity High-Speed Elevators

Large capacity elevators are of increasing demand in terms of fast transfer of passenger to top of skyscraper nowadays, especially for area with

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very high population density. For instance, those four high-speed, large capacity shuttle elevators in Tokyo Skytree have capacity of 40 persons with maximum speed of 600m per minute. These shuttle elevators are able to carry passengers up to 350m in only approximately 50 seconds [11]. For the same purpose to expedite the passenger flow, there are also large capacity elevators installed in Hong Kong commercial buildings in the last decade mainly in area of Central and Causeway Bay.

## Riding Comfort Development For Elevators

Riding comfort often plays an important role and even a benchmarking for elevator technology in the point of view from passengers. The inverter control application in elevators emerged from ACVV to ACVVVF in the past two decade have made great improvement on the riding comfort as well as leveling accuracy to a satisfactory level. The development of guide shoes technology also plays an important role on the riding comfort as it is aiming for guiding an elevator car along guide rails in an elevator shaft. There is new invention magnetic guide shoe system for the elevator car comprises permanent magnet devices arranged to maintain a horizontal distance between the elevator car supporting frame and guide rails in order to damp the propagation of vibration into the elevator car interior and therefore enhance the passenger elevator travel experiences.

## Energy-Efficient Software

### Destination Dispatching Systems

The Destination Dispatching System (DDS) groups passengers with the same destinations and move them more rapidly to their destination. Upon entering a destination by using keypads or touch screens on the Destination Operation Panel (DOP), the system quickly signals and directs

each passenger to the assigned elevator to board (Figure 4).

The DDS provides significant benefits including less energy consumption, shorter waiting time, and less crowding and congestion in the building lobbies and hallways. The number of elevators required is greatly reduced owing to increased efficiencies of DDS in managing a large number of people. It can minimize wear and tear of elevators because fewer stops are made [12,13].

### People Flow Solutions

Similar to the DDS, People Flow Solutions intends to smooth pedestrian flow and manage demand on elevators yet mostly in extreme cases. This is demonstrated in the case of the Abraj Al Bait Hotel Complex in Makkah, Saudi Arabia. The challenging task is to enable 75,000 people living in the building complex to join the five daily prayers in the Masjid Al Harm in less than 30 minutes, and then bring them back to the hotel in a similar period of time. Thus, a careful study on understanding and tracking passengers' traffic patterns is necessary to provide ideal solutions so as to enhance the pedestrian flow solution [14].

### Standby Solutions

In-cab sensors and software automatically switch to a "sleep mode," turning off lights, fans, music, and video screens when it is not in use. Energy savings from standby solutions are determined by various factors, including the employed control system, lighting type, floor displays and operating consoles in each floor and inside the elevator cabin. .

### Escalator Standby Speed

In addition, the escalator standby speed when idle should comply with the Code of Practice for Energy Efficiency of Building Services Installation with effective from 2015 in Hong Kong. It clearly states that "Automatic Speed Reduction of Escalator Switching provision should be made for each escalator to operate under automatic speed reduction mode when the traffic demand is low. Further consideration in respect of safety, operation and riding quality should be conducted when deploying automatic stop at low traffic demand period."

### Virtual Reality Diagnostics

The virtual reality (VR) technology, originally invented for games and entertainment, has been gradually penetrating into the industry. This technology has changed greatly the way

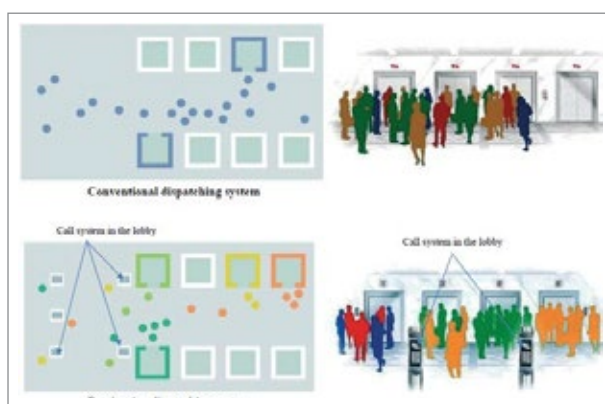


Figure 4. Conventional (top) versus destination dispatching system (bottom).

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mechanics do elevator repairs and maintenance. Putting on a virtual reality headset, an elevator mechanic can poke around an elevator motor without climbing tens of floors or dangling in a precipitous shaft. Also, the user can then dismantle the engine and examine its individual parts. The view can also be widened, allowing the mechanic to do a virtual “walk through,” in order to find places where repairs or replacement are needed [15]. Moreover, particularly, the virtual reality technology has already developed and applied for safety training in the elevator industry in Hong Kong, and helping the mechanics to carry out the repair and maintenance much more safely.

## The Way Forward

It is believed that the elevator industry would continue to transform with the technological advancements. Elevators will be smarter, greener and more energy-efficient in the future.

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# THE DEVELOPMENT OF BUILDING SERVICES ENGINEERING IN HONG KONG

## Digital Transformation in Building Services Industry

Alvin Lo, Associate Director of Building Sustainability, Arup, CEng MCIBSE

### Introduction

Digital is unlocking new value and transforming the entire stakeholder ecosystem, across each and every phase of building development. Building Services Engineers are enjoying more seamless and integrated experiences through the uses of ubiquitous sensors, flexible and open IT systems as well as powerful cloud computing. As the tools are getting better, faster, smarter and more powerful, the building services industry in Hong Kong is adapting to a new way of thinking and working to fully leverage them. Hence, new opportunities are emerging endlessly. Currently, this rapid and continuous transformation has evidently demonstrated its benefits:

1. Merging the digital and physical environments in a hybrid space with 3D visualisation;
2. New forms of integration and control with open protocols; and
3. Enabling data analysis, artificial intelligence (AI) and machine learning (ML) integration through cloud-based computing and storage

### Merging the Digital and Physical Environments in a Hybrid Space with 3D Visualisation

The merging of actual physical into virtual digital environments is achieved through Building Information Modelling (BIM). It enables the coordination of the interdependent and complex physical building systems in a data-rich virtual environment, improving the entire building lifecycle from demolition phase, design phase, engineering and construction phase, to building operation and maintenance (O&M) phase.



BIM enhances the project coordination as only a single but unified model is created, in which the design teams, and owners/decision-makers can access in real-time at any stage of project delivery. It is also successful in bringing advancement in construction visualisations and digital fabrication. Additionally, the implementation of virtual reality (VR) and mixed/augmented reality (AR) not only benefits to the project team to explore and experience different possible solutions earlier in the development process, but also provide the attentive services for tenants to experience the expected built environment even before the completion of construction.



In Hong Kong, the piloting of BIM was commenced in 2006 by the Housing Authority in the development of public housing projects. Subsequently in 2014, the Construction Industry Council (CIC) issued a roadmap for BIM strategic implementation in Hong Kong's construction industry, but the focus did not cover much on building services. In this regard, a research study "Towards Adoption of Building Information Modelling in Building Services Engineering in Hong Kong" was undertaken jointly by the Chartered Institution of Building Services Engineers - Hong Kong Branch CIBSE HK Branch, the Hong Kong Institution of Engineers - Building Services Division (HKIE-BSD) and the Hong Kong Polytechnic University (PolyU) in 2015, with the aim of promoting adoption of BIM in the building services industry in Hong Kong. Following on, from the 2017 Policy Address, the Development Bureau issued the Technical Circular (Works) No. 7/2017. It mandated the use of BIM technology, from 2018 onwards, for capital works projects with project estimates at more than HK\$30 million. To echo with the initiative of BIM application in construction, the Electrical and Mechanical Services Department (EMSD) launched the Building Information Modelling for Asset Management (BIM-AM) Standards and Guidelines in late 2017, which further expanded the BIM adoption to O&M stage.

### New Forms of Integration and Control with Open Protocols

Providing an open controls approach based on scalable web technologies enables simplified, adaptable and horizontal integration of sensing and actuating systems at lower cost. Buildings often have

# THE DEVELOPMENT OF BUILDING SERVICES ENGINEERING IN HONG KONG



multiple data systems (HVAC, Lighting, P&D, Security, Fire, Electrical, ELV etc.) through standalone system or building management system (BMS) which have limited interoperability due to a lack of common, well-structured languages and protocols. Making data accessible using open standardised APIs and intuitive interfaces will help to create a building-wide Internet of Things (IoT) usable in a joined-up way, allowing data systems to “communicate” to each other. Incorporating with data management, cloud computing and sensor technology, the monitoring and controlling of system performance and energy management by O&M professionals has transformed. The “communication” between data systems allow them to obtain real-time information for routine operations and incident response as well as historic data. By analysing these wide variety of data, building services engineers are able to identify trends in environmental impacts, energy use patterns, building operation profile and occupants’ responses to allow effective planning for the future. Hence, open protocols adoption would generate more value for occupants, operators and other stakeholders.

There is an example of smart office building in Hong Kong which allows users to control their environmental conditions in a convenient way due to open protocols – via their smartphone. Building users can access and control the real time environmental conditions, simultaneously O&M professionals can understand users’ habits and practices through the data. This facilitates a smart and sustainable working environment, establishing an environmental-friendly culture, intelligent workstyle and healthy built environment.

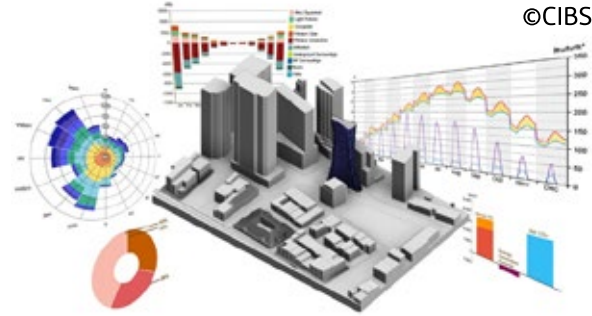
## Data Analysis, Artificial Intelligence (AI) and Machine Learning (ML) Integration through Cloud-Based Computing and Storage

The Cloud enables “ubiquitous, on-demand access to a shared pool of configurable computing resources (e.g., computer networks, servers, storage, applications and services) that can be rapidly provisioned and released with minimal management effort.” Cloud-based computing helps shift digital resourcing and investment from a capital expense to an operating expense, creating a fertile ground for a proliferation of digital services that can create value for developers,

tenants and owner/occupiers.

This improves efficiency by increasing integration and automation of building operations, creating opportunities for O&M professionals to strategically

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maximises the use of building and assets within. Besides, tenants and occupants’ expected built environment experience would be driven up, both functionally and emotionally, as they can benefit from a range of integrated services that support individual needs and preferences. Furthermore, given the long lifecycles of buildings, a wealth of actionable data can be analysed to provide O&M professionals new abilities in adapting to the ever-changing users’ needs over throughout the lifecycle of building. Hence, far better portfolio management and planning in building can be achieved.

Recently, these new cloud-based data systems, powered by AI and ML, are being progressively implemented in a Grade A Commercial Development in Hong Kong. A large amount of data are stored, processed and visualised, creating portfolio-wide insights and enhancing system performance in particular to real time chiller plant and equipment optimisation, while reducing resources consumption at the same time.

## Towards an Integrated Smart and Digital Future

As the new technology has emerged to disrupt and reconstruct our industry, it is time to look beyond tools and techniques to immerse ourselves into the craze of digitalisation. From the perspective of incorporating digital in its strategy, the current construction industry in Hong Kong is still running a little behind comparing to other industries. However, digital transformation in our industry is definitely under way. To cope with the revolution, the Society of Digital Engineering (SDE), which is part of the CIBSE, has been formed to provide a fertile ground for those involved in digitising the built environment through series of publications and trainings. The SDE has the aim to assist the complete supply chain of built environment in tackling the practical challenges, especially in the BIM processes and digital engineering, to a broader and deeper extent. For more details please refer to : <http://www.cibse.org/> Society-of-Digital-Engineering-SDE.

# PAST CHAIRS OF THE CIBSE HK BRANCH FROM 1979 TO 2018

Ian PHILLIS  
Jan 1979 to Apr 1979



Edwin TAO  
Apr 1979 to 1980



K O YEUNG  
1998 to 2001



Peter Y WONG  
2001/02

James CHEUNG  
2002/03



Victor CHEUNG  
2002 to 2004



Ronald CHIN  
2004/05



Thomas CHAN  
2005/06



Philip CHAN  
2006/07



Thomas SOON  
2007/08



# PAST CHAIRS OF THE CIBSE HK BRANCH FROM 1979 TO 2018



**Victor LEUNG**  
2008/09



**Herbert LAM**  
2009/10



**Dr. T M CHUNG**  
2010/11



**C K MOK**  
2011/12



**Vincent LUK**  
2012/13



**John CHEUNG**  
2013/14



**Dr. P L YUEN**  
2014/15



**C M CHUNG**  
2015/16



**KYLEUNG**  
2016/17



**Stanley CHOW**  
2017/18

# COMMITTEE OF THE CIBSE HK BRANCH 2018/19 SESSION



*From Left to Right:*

*Chris Kwan, Vincent Ma, CM Chung, Joey Mo, Tony Ngan, KL Chan, Stanley Chow, Peter Long, TC Chan, Keith Ma, Gary Chiang, Sam Hui, Ethan Poon, Tony Lam*

|                            |  |
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| <b>Dr. Raymond KL CHAN</b> | Vice-Chair   |
| <b>Tony NGAN</b>           | Honorary Secretary                                       |
| <b>Peter LONG</b>          | Honorary Treasurer                                       |
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| <b>Vincent MA</b>          | Technical Activities Co-ordinator                        |
| <b>Gary CHIANG</b>         | Conference Co-ordinator                                  |
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| <b>Tony LAM</b>            | YEN Chair  |
| <b>Dr. Sam HUI</b>         | Co-opted Member  |
| <b>Ethan POON</b>          | Co-opted Member  |
| <b>Alvin LO</b>            | Co-opted Member  |
| <b>Chris KWAN</b>          | Co-opted Member  |
| <b>Dr. Anthony LO</b>      | HKIE BS Division Co-ordinator                            |
| <b>Dr. Dennis TUNG</b>     | ASHRAE HK Chapter Co-ordinator                           |

# Building Performance with Engineering Excellence



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**LIGHTING**

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**OPERATION**

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**INNOVATION**



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# MAJOR ACTIVITIES OF THE CIBSE HK BRANCH



Inauguration of CIBSE HK Branch on 17 Jan 1979



5-a-side Soccer Tournament (2001)



Basketball Tournament (2002)



Shandong-HK Joint Symposium (2003)



Annual Dinner (2003)



CIBSE HK Branch Annual General Meeting (2004)

# MAJOR ACTIVITIES OF THE CIBSE HK BRANCH



Golf Tournament Award Presentation and Dinner (2004)



Shanghai Association for Science and Technology (SAST)-CIBSE Cooperation Meeting (2005)



Hubei-HK Joint Symposium (2005)



HK Joint Symposium (2005)



Annual Dinner (2006)



CIBSE One-Day Workshop on CIBSE Guide A (2006)

# MAJOR ACTIVITIES OF THE CIBSE HK BRANCH



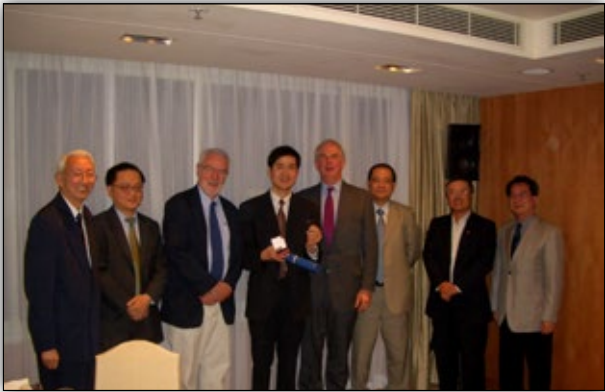
CIBSE Dart Tournament (2006)



Inter-institutions Soccer Tournament (2006)



Annual Dinner (2007)



CIBSE President Elect Reception Dinner and CIBSE Medal Presentation (2007)



Henan-HK Joint Symposium (2008)



CIBSE HK Branch Annual General Meeting (2008)

# MAJOR ACTIVITIES OF THE CIBSE HK BRANCH



CIBSE HK Branch 30th Anniversary Dinner (2009)



CIBSE HK Branch 30th Anniversary Dinner (2009)



Changsha-HK Joint Symposium (2011)



CIBSE One-day Workshop on CIBSE Guide D (2012)



ArchSD Communication Meeting with 3 Institutions (2013)



Joint-Institutions Bowling Competition (2013)

# MAJOR ACTIVITIES OF THE CIBSE HK BRANCH



Meeting with BSE Department of HK Polytechnic University (2013)



Annual Dinner (2015)



Heilongjiang-HK Joint Symposium (2015)



CIBSE Global Conference of YEN in HK (2015)



Asia Pacific Conference on the Built Environment (2015)



Annual Dinner (2016)



# MAJOR ACTIVITIES OF THE CIBSE HK BRANCH



MoU Signing Ceremony of 4 Institutions in Macau (MIE, ASHRAE Macau, HKIE-BSD, CIBSE HKB)(2016)



CIBSE President Elect Reception in British Consulate (2016)



CIBSE SLL Lighting Guides Seminar (2017)



Meeting with SAST in Shanghai (2017)



CIBSE Lighting Seminar in Shanghai (2017)



Shanghai Disney Technical Visit (2017)

# MAJOR ACTIVITIES OF THE CIBSE HK BRANCH



Presentation of Past-Chair Medals in Annual Dinner (2017)



Level 3 BIM Strategic Plan Forum in British Consulate (2017)



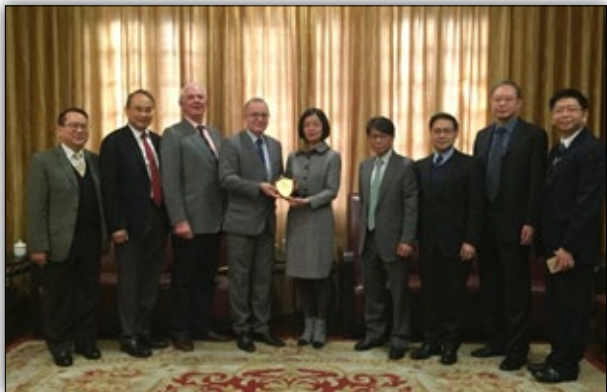
CIBSE President Reception in British Consulate (2017)



CIBSE President Elect Keynote Speech in HK Joint Symposium (2017)



CIBSE President Reception in Shanghai (2017)



CIBSE President Meeting with SAST in Shanghai (2017)

# MAJOR ACTIVITIES OF THE CIBSE HK BRANCH



Joint Comprehensive Certificate Course on Fire Services System in Smart City (2018)



Joint Technical Visit to Tin Shui Wai Hospital (2018)



Special Committee Meeting with CIBSE President Elect and Board Members (2018)



CIBSE Reception and Presidential Visit in Macau (2018)



HK Joint Symposium (2018)



CIBSE One-day Seminar on Renewable Energy Technology and Application (2018)

# COMMITTEE OF THE CIBSE SHANGHAI PANEL



*Shanghai Panel Annual Dinner with Prof. PAN Yong Hua (Hon Fellow)*

|                      |                                     |
|----------------------|-------------------------------------|
| <b>Alpha CHU</b>     | Shanghai Panel Chair                |
| <b>Kelvin TANG</b>   | Shanghai Panel Immediate Past Chair |
| <b>Jacky WONG</b>    | Shanghai Panel Secretary            |
| <b>Chun Hung KEI</b> | Shanghai Panel Treasurer            |
| <b>Dr. Liang XIA</b> | Shanghai Panel Events Co-ordinator  |

# PAST CHAIRS OF THE CIBSE YEN HK



|                |               |
|----------------|---------------|
| <b>2001-02</b> | Patrick KWAN  |
| <b>2002-03</b> | Patrick KWAN  |
| <b>2003-04</b> | Jovian CHEUNG |
| <b>2004-05</b> | Jason CHAN    |
| <b>2005-06</b> | Eric NGAI     |
| <b>2006-07</b> | Alvin LO      |
| <b>2007-08</b> | Wendy KWOK    |
| <b>2008-09</b> | Stephen LEE   |
| <b>2009-10</b> | Joey MO       |
| <b>2010-11</b> | Macy Wong     |
| <b>2011-12</b> | Wendy CHIU    |
| <b>2012-13</b> | Ethan POON    |
| <b>2013-14</b> | Chris KWAN    |
| <b>2014-15</b> | Mandy WONG    |
| <b>2015-16</b> | Eve LEUNG     |
| <b>2016-17</b> | Marcus CHAN   |
| <b>2017-18</b> | Steven CHOW   |

# COMMITTEE OF THE CIBSE YEN HK 2018/19 SESSION



|                        |   |
|------------------------|---|
| <b>Tony LAM</b>        | Chair                                   |
| <b>Steven CHOW</b>     | Immediate Past Chair                    |
| <b>Mianne CHU</b>      | Vice-chair                              |
| <b>Juan LO</b>         | Honorary Secretary                      |
| <b>Patrick FUNG</b>    | Honorary Treasurer                      |
| <b>Felix FUNG</b>      | Branch Activities Coordinator           |
| <b>Yoyo WONG</b>       | Branch Activities Coordinator           |
| <b>Ban IP</b>          | Branch Activities Coordinator           |
| <b>Alex LO</b>         | Communications & Networking Coordinator |
| <b>Jimmy LEUNG</b>     | Communications & Networking Coordinator |
| <b>Kristi CHONG</b>    | Communications & Networking Coordinator |
| <b>Yuen-yee FAN</b>    | Professional Development Coordinator    |
| <b>Kwan-ho SHING</b>   | Professional Development Coordinator    |
| <b>Michael LAI</b>     | Professional Development Coordinator    |
| <b>Joyce LEUNG</b>     | Promotion & Public Affairs Coordinator  |
| <b>Phyllis WONG</b>    | Promotion & Public Affairs Coordinator  |
| <b>King WONG</b>       | Promotion & Public Affairs Coordinator  |
| <b>Esther MAK</b>      | Co-opted Member                         |
| <b>Irene KWAN</b>      | Co-opted Member                         |
| <b>Martin YIM</b>      | Co-opted Member                         |
| <b>Connie CHAN</b>     | Co-opted Member                         |
| <b>Alan CHAN</b>       | Student Coordinator                     |
| <b>Bosco NGAN</b>      | Student Coordinator                     |
| <b>Jacky CHEUNG</b>    | Student Coordinator                     |
| <b>Samuel YAM</b>      | Student Coordinator                     |
| <b>Ching-yin LEUNG</b> | Student Coordinator                     |
| <b>Alvin LEUNG</b>     | Student Coordinator                     |
| <b>Brian LOOK</b>      | Student Coordinator                     |
| <b>Ho-ching CHAN</b>   | Student Coordinator                     |
| <b>Wai-kei CHAN</b>    | Student Coordinator                     |
| <b>Wai-kin CHAN</b>    | Student Coordinator                     |
| <b>Chin-wai FUNG</b>   | Student Coordinator                     |
| <b>Ernest SO</b>       | Student Coordinator                     |
| <b>Marco YUEN</b>      | Student Coordinator                     |

# MAJOR ACTIVITIES OF THE CIBSE YEN HK

## Young Engineers Network of CIBSE Hong Kong Branch

Tony Lam, CIBSE YEN HK Chair, CEng MCIBSE

The idea of setting up the Young Engineers Network (former name as Young Members Group) of CIBSE HK Branch, namely CIBSE YEN Hong Kong Branch, was brought up in CIBSE Hong Kong Branch Committee Meeting held on 14 May 2001. A Task Force on CIBSE YEN Hong Kong Branch comprising the Conveyor, Mr. Patrick Kwan, and prospective YEN Committee members was set up on 17 Sept 2001 with a view to carrying out all preparatory works for establishing the CIBSE YEN.

Young Engineers are the future of the building services industry. CIBSE YEN Hong Kong Branch is an affiliated body under CIBSE Hong Kong Branch and aims at catering for the needs and interests for all CIBSE young members of any class, who are at the age of 35 or below.

We are active and enthusiastic for:-

- Promoting a positive and welcoming image for CIBSE among local students and young members.
- Bolstering cohesion among young members through their participation in CIBSE activities.
- Providing a forum and support network for young engineers within CIBSE.
- Identifying the needs of young members and organizing various activities to suit their interests and meet their expectations.
- Facilitating the interflow of knowledge and experience with other professional institutes through their young members organizations.

We interacted closely with YEN in other regions in exchanging and sharing news. In Nov 2015, we were the first region to organize Global YEN Conference and played the leading role in arranging the itinerary for



the delegates of other regions. We and delegates of other regions visited many buildings with remarkable building services design such as Zero Carbon Building



and ICC Building etc. We also organized a Kung Fu Class for the delegates to know more about Chinese culture. There were a total of 22 YEN delegates from other regions, including UK, UAE, Australia and New Zealand joined the Global YEN Conference. We were pleased to invite CIBSE HK Branch's Chair (2015-2016), Mr. C. M. Chung and committee members to join the welcome dinner of Global YEN Conference.

On 31 March 2017, we organized a reception to celebrate 15<sup>th</sup> anniversary of CIBSE YEN Hong Kong Branch. The President Elect (2016-2017), Mr. Peter Wong, CIBSE HK Branch's Chair (2016-2017), Mr. K. Y. Leung, the Conveyor of CIBSE YEN, Mr. Patrick Kwan, committee members, Past Chairs of CIBSE YEN Hong Kong Branch and Chairs of other professional institutes were invited as honorable guests to share the joyful moment.

During the past years, we have organized a number of seminars, technical visits and competitions for local students and young members, including technical visit to Ocean Park and HAECO, seminars on BIM and retro-commissioning and photography competition on building services industry, etc. Each year, we organized career talk to local students and chartership and membership briefing session to young members to ensure that young engineers and local students engage more closely with our professional institution at an early stage in their careers.

We always collaborate with other professional institutes and co-organize activities and functions for young members. We co-organize One Day Seminar with HKIE YMC, HKIS YSG, ICE HKA G&S and CI Arb(EAB) YMG in each year for young members to attain more knowledge on contract management. We also co-organized social activities with other professional institutes for young engineers to broaden the networking in different working streams.

Apart from seminars and activities, CIBSE YEN Hong

# MAJOR ACTIVITIES OF THE CIBSE YEN HK

Kong Branch organized YEN Retreat in Nov 2018 in Taiwan. The aims of YEN Retreat 2018 is to allow YEN committee member to review YEN's events, member services & promotion in previous years and in order to plan for the coming activities and enhancement of YEN's function and capacity. In the coming years,



Besides, we have gained valuable and unforgettable experience and knowledge in assisting CIBSE Hong Kong Branch to organize various technical and social activities such as CIBSE annual dinner, China-Hong Kong annual joint symposium, CIBSE one day seminar, etc.



the major task of YEN is to focus on the promotion of YEN to building service course student, we would like to engage more BSE student to join YEN committee and let them have more contribution on YEN event. This allow continuous succession and development of YEN.

Apart from YEN committee meeting, YEN's young engineers and young engineering students can also broaden their horizons through the exposure to overseas and interaction with the experts in the construction field of other countries. During the three-day trip, we focused on learning the new renewable energy technology by having seminars and site visits to Taiwan's manufacturers of Photovoltaic Panels. We had a fruitful experience in learning the new technologies from other country and looking forward to the next retreat.



# MAJOR ACTIVITIES OF THE CIBSE YEN HK



31 Mar 2017 – YEN 15th Anniversary Reception



15 Jul 2017 – Technical Visit to HAECO



12 Aug 2017 – Technical Visit to Alice Ho Miu Ling Nethersole Hospital



7 Sep 2017 – Chartership Talk



# MAJOR ACTIVITIES OF CIBSE YEN HK



28 Mar 2018 – Safety Seminar on  
“Applying ISO 9001 in Temporary  
Electricity Safety Standard”



14 Apr 2018 – YEN Chair Conference



18 Aug 2018 – CIBSE YEN HK First Meeting for 2018/19  
Session

# MAJOR ACTIVITIES OF CIBSE YEN HK



30 Apr 2018 – STEM activity in TM



3 May 2018 – Chartership Experience Sharing Session



5 May 2018 – One Day Seminar on Contract Management 2018



31 May 2018 – Technical Seminar on Firestop Technology



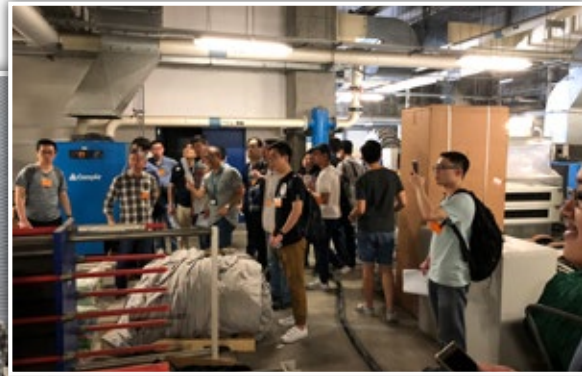
# MAJOR ACTIVITIES OF CIBSE YEN HK



16 Jun 2018 – Sport Tournament with AABSE, CityU, PolyU and Thei



28 Jun 2018 – Technical Visit to HAECO at Chek Lap Kok



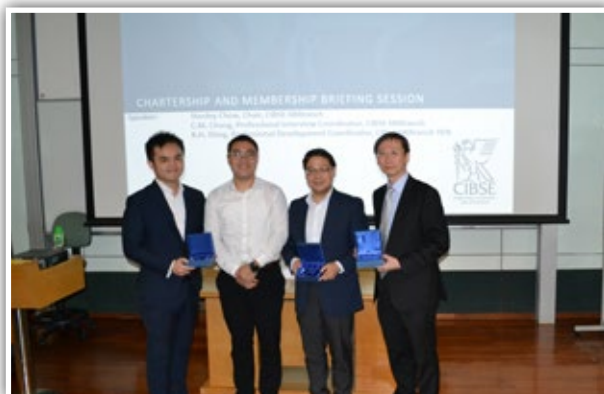
18 Aug 2018 – Technical Visit to Schneider Electric "Innovation Hub"



# MAJOR ACTIVITIES OF CIBSE YEN HK



14 Sep 2018 – Technical Workshop on Lift & Escalator Modernization



25 Oct 2018\_Chartership and Membership Briefing Session



3 Nov 2018 – YEN Hiking



10 Nov 2018 – YEN Retreat



29 Nov 2018 – Technical Seminar on Retro-commissioning



# CIBSE 40 Hong Kong

## ORGANIZING COMMITTEE OF THE CIBSE HK BRANCH 40<sup>TH</sup> ANNIVERSARY

**KL CHAN**

**CK MOK**

**CM CHUNG**

**KY LEUNG**

**Stanley CHOW**

**Keith MA**

**Peter LONG**

**Joey MO**

**Ethan POON**

**MY CHAN**

**Tony NGAN**

**Tony LAM**

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4. Inland Revenue Tower



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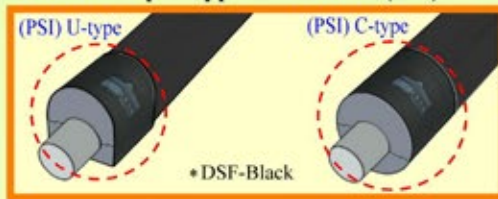


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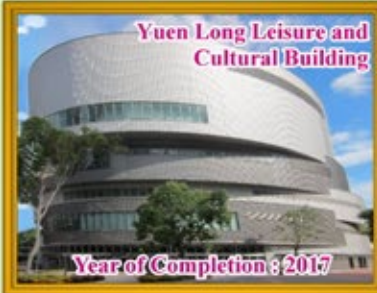
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Year of Completion : 1998



Nina Tower  
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Year of Completion : 2007

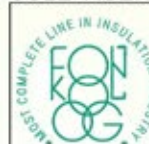


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Kowloon Bay, KLN.  
Year of Completion : 2013



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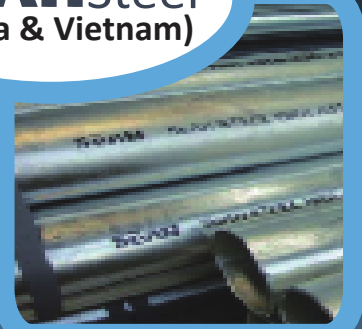
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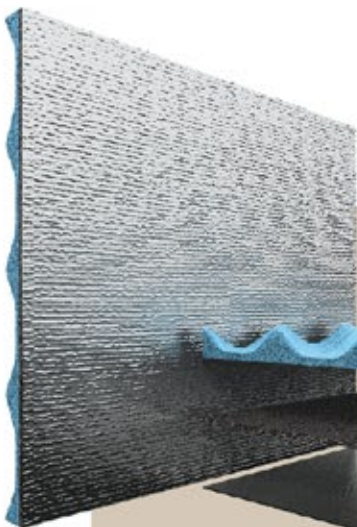


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25mm decoupling  
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5kg / m<sup>2</sup> mass loaded  
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- Engineered product to reduce noise break-out from pipe
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Model: Mason Acoustics AC-PY-4525



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## 3. Restaurant



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Ceiling Cassette Indoor Unit

## 4. Commercial Building



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Water-cooled Condensing Unit



Ceiling Concealed Indoor Unit

## 2. Shopping Mall



Water-cooled Magnetic Bearing Oil Free Chiller

## 8. Education



Air-cooled High Efficiency VFD Screw Chiller

## 5. Hospital



Air-cooled Magnetic Bearing Oil Free Chiller



AAF Air Filter

## 1. Government Building

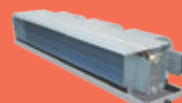


Water-to-water Heat Pump

## 7. Hotel



AAF Air Handling Unit



DC Fan Coil Unit

## 6. Residential Building



Wall Mounted Indoor Unit



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- High Adaptation
- High Reliability
- Intelligent Control System
- Silent Operation (73 dB(A))

## Unit Member



## Features

Midea inverter direct-drive centrifugal compressor adopts the patented technologies as follow:

- 1) Horizontally back-to-back self-balanced impeller
- 2) Impeller profile joint and fastening technology
- 3) Inlet guide vane regulating mechanism with rolling element
- 4) Integration design of thrust plate and rotation axis
- 5) 360° inverter motor cooling technology
- 6) A centrifugal chiller inlet guide vane correcting algorithm
- 7) Gas-inlet regulation mechanism and centrifugal compressor with this mechanism



Midea Chiller Sole and Exclusive Distributor for Hong Kong and Macau



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## Recent Job References:

\*Photos are for reference only.





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1945

Ducab HV offers High Voltage cable system up to 400KV



2011

Callenders of Erith was founded (later became Callenders Cable & Construction Co.).



1882

Supplied power cable for two major projects: Dubai Metro & Burj Khalifa - the highest building in the world.



2004 to 2010

Ducab Aluminum Company



2016

The legacy continues...



1979

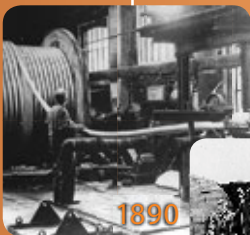
As a joint venture, the Government of Dubai partnered with BICC to form Ducab BICC.



2013

Introducing Ducab RuBICC (H07RN)

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1890

British Insulated Wire Co. was founded.



2008

Copper Rod Plant



2014

Ducab Acquires AEI

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- \* Public Facility: Tsing Yi Sport Centre; Hong Kong Sport Institute; Yuen Long Library; Macpherson Indoor Stadium; Ko Shan Theatre; TKO Velodrome; Shatin Yuen Chau Kok Sport Centre; TKO Sport Centre & Public Library; Environmental Hygiene Offices; Sham Tseng Sewage Treatment Works; Stonecutter Sewage Treatment Works; Yuen Long Sewage Treatment Works
- \* School: ISF Academy; Malvern College; Canadian International School; French International School; Diocesan Girl School; Shrewsbury International School; Hang Seng Management School; University of Hong Kong; TKO Fire Services Training School
- \* Hotel: Grand Hyatt; Marco Polo; Shangri-La; YMCA; SJM Grand Lisboa; Ocean Park Marriot; Disney's Hollywood; YMCA; Holiday Inn Express; Dorsett; Hotel COZI; Wharney Gaungdong
- \* Clubhouse: Cathay Pacific Airways - The Pier & The Bridge; Leighton Hill; Pavilia Hill; Vineyard; Harbor One; Parc Inverness; Sky Park; Park Signature; TKO Plaza; Capri; M Residence; Nova City; Lohas P6 & P8; Deep Water Bay 8-12; Kai Tak 6541/6525/6527; Ho Man Tin 11227/11228; Shatin 56A/579; TMTL 423/453/543
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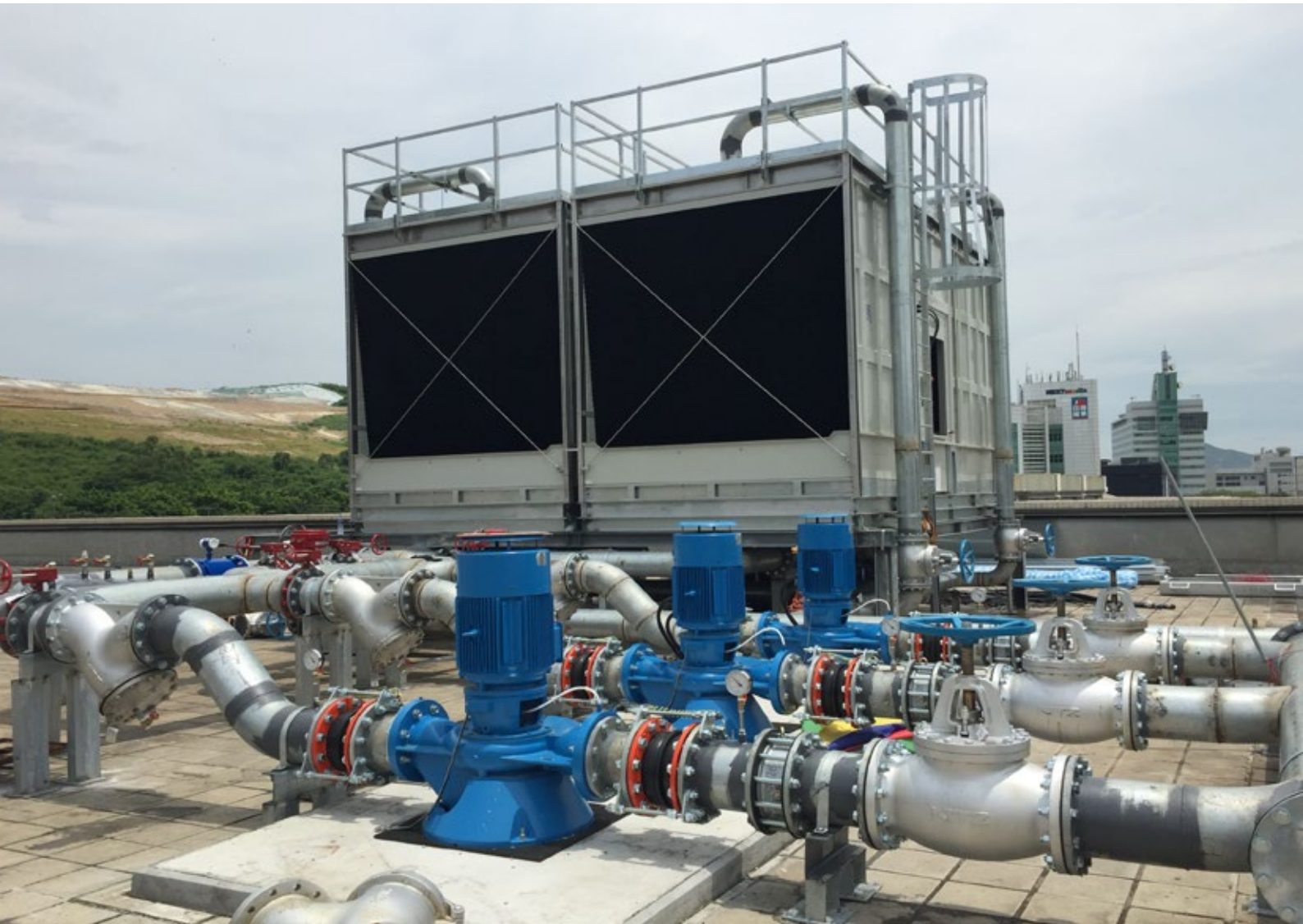


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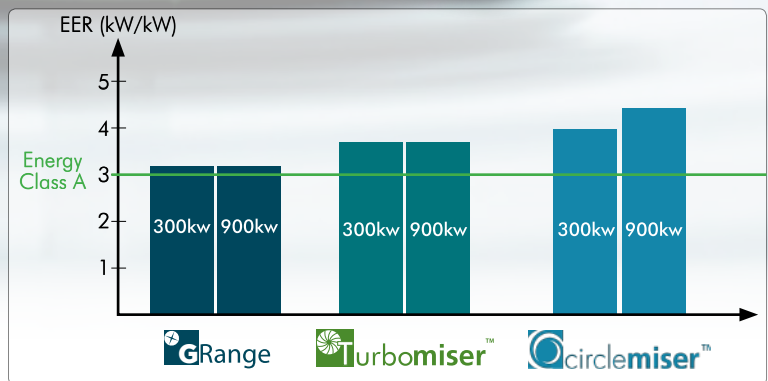
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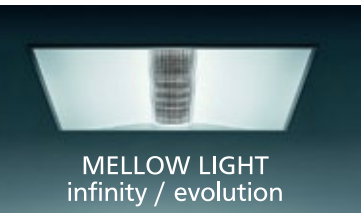
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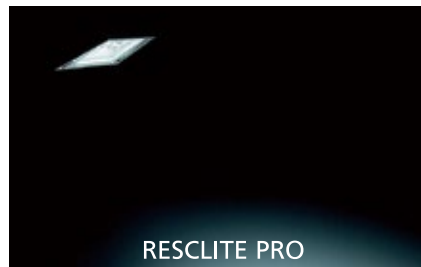
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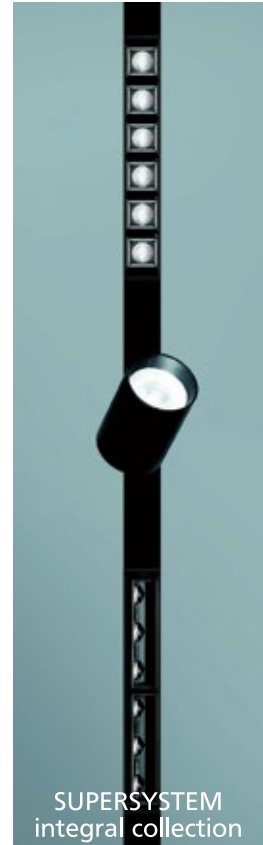
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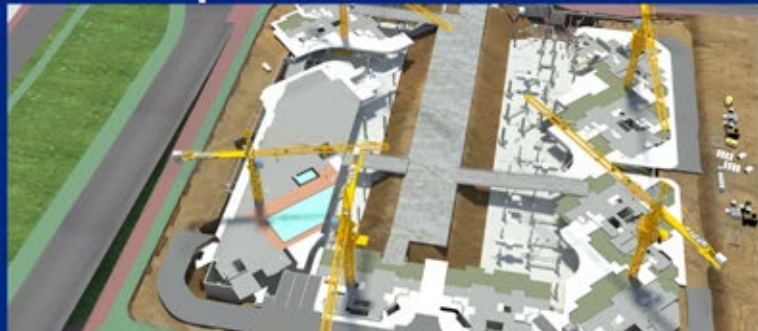
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