CIBSE HONG KONG AWARDS 2021

Building Performance with Engineering Excellence

Preface

Riding on the success of CIBSE Building Performance Awards (BPA)[1] in UK, the new CIBSE Hong Kong Awards programme on Building Services Engineering as pilot in Hong Kong context initiated by CIBSE Hong Kong Region (HKR) was first launched in 2019.

In recognition of demonstrated engineering excellence in the built environment, the Awards can provide a new ground for encouraging projects in (a) building construction industry and (b) facility management industry. Most importantly, it would drive Organisations and engineering professionals to collaborate and deliver the most appropriate and cost-effective solutions from design right through to installation and beyond with common goals to improve efficiency, quality, safety and reduce operating costs through more effective building services installation to the benefit of business and society.

The second CIBSE Hong Kong Awards which has been launched in January 2021 is the only industry award that focus on actual, measured performance outcomes in built environment, and not just design intent or performance specifications. Entries are open to any Organisation within Hong Kong, that is responsible for the design, construction, installation, commissioning and operation of low energy buildings with high quality built environment.

The Awards remain true to our professional mission by free to enter, and by minimising the burden of filling out forms. We look forward to learning and sharing the success stories of the winners. More encouraging, we sincerely anticipate that winners of the Awards would equip their achievement to submit qualified entries to participate into the coming CIBSE Building Performance Awards in UK.

Award

a) **Project of the Year Award**
- Project of the Year Award (for winner)
- Merit Award (for Shortlisted)

b) **Facilities Management Team Award**
- Facilities Management Team Award (for winner)
- Merit Award (for Shortlisted)

c) **COVID-19 Achievement Award**
- COVID-19 Achievement Award (for shortlisted)

[1] *The CIBSE Building Performance Awards, now in their 14th year, recognise the people, products and projects that demonstrate engineering excellence in the built environment. (https://www.cibse.org/building-performance-awards/about)*

Categories for Entry

a) Project of the Year Award

- Commercial/Industrial Building
- Public Use Building
- Residential Building
- Retrofit Building

The Awards recognise the building project (new or refurbished) that most effectively demonstrates achievement of high levels of user satisfaction and comfort and outstanding measured building performance, energy efficiency and reduced carbon emissions. Sub-categories in specific building usage are given below:

Categories (Sector based)	Building Usage	Example (building owner / building name)
Commercial / Industrial Projects	Building that is mainly a) used for offices, shops, entertainment facilities; and etc. b) used for the purpose of any trade, business or profession (including industrial use)	Building Developers, Data Centre, Commercial Office Block, Private Club Houses, Hotel, Commercial Complex, Club House, Convention and Exhibition Centre, Theme Parks and etc.
Residential Projects	Building that is mainly used for residential purposes and includes public housing, hostels, hotel and staff quarters	Housing Authority, Hong Kong Housing Society, Private Residential Development, Government Quarters and etc.
Public Use Projects	Building that is mainly used for general public purposes and includes functions managed by government / non-government Organisation, public utilities, public Organisation, quasi-government Corporation/ Public Institutions.	Airport Authority, University, Hospital Authority, Government Offices, Vocational Training Council, Health Centre, MTR, West Kowloon Cultural District Authority and etc.
Retrofit Projects	Retrofit project of whole building or of any substantial or significant part of a building only.	Open to all types of buildings.

b) Facilities Management Team Award

Most facilities management teams work in a range of areas, combining resources and activities to deliver a safe, healthy and efficient work environment. This award recognises and celebrates the achievements of the facilities management (FM) team, whether in-house or outsourced, who delivers outstanding operational performance from an individual building, a site with several buildings, business premises including supporting facilities or a portfolio of assets. This includes delivering the comfort levels and working conditions required by the users while demonstrating substantially reduced carbon emissions, energy, water consumption and effective waste management.

c) COVID-19 Achievement Award

Building Services Engineering plays a significant and important role in tackling the job of creating safe and healthy environments. This Award recognises the remarkable work that Building Services professionals with the Building Services supply chain have undertaken and contributed to combat the effects of COVID-19. The Award recognises, celebrates and be presented for the outstanding achievements of individuals, teams, organisations, projects, products or services by assessing the challenges they have faced across the full range of activities in the built environment, and the impact they have made in responding to unprecedented circumstances in 2020.

Content

Message from **CIBSE Chief Executive**

The CIBSE Building Performance Awards ceremony is held annually in London and attended by over 700 guests. It is an excellent opportunity to recognise and celebrate the remarkable projects and professionals that contribute to better buildings and better building performance. It's wonderful to see that the CIBSE Building Performance Awards has become one of the most prestigious industry awards in the UK and the world.

I am not an engineer by training or profession, but I have had ample opportunity to work closely with many engineers in my previous roles. And I am grateful to them for their knowledge, professionalism, skills and experience. They are instrumental in transforming and protecting our shared built environment and vital to creating smart and sustainable cities.

There are many CIBSE members in many countries around the world; of the 195 countries, CIBSE has members in 95 countries, but the largest and most significant presence is in Hong Kong. Building services engineers in Hong Kong have been instrumental in creating better-performing buildings using innovative design and applications. There is a vital connection between the Hong Kong Region Awards and the London Building Performance Awards. They both showcase projects completed by our professional engineers, and those exemplar projects provide opportunities to share knowledge and improve outcomes in all buildings.

We are excited to support the Hong Kong Region awards and to demonstrate and share best practices across the world. We would also encourage all of you in attendance to actively participate in CIBSE activities, seminars, CPD courses, and the various excellent conferences the Hong Kong Region organises each year.

Everyone in this room recognises that a buildings' performance depends on the skills, professionalism, dedication, and expertise of Building Services Engineers; these awards celebrate that immensely important contribution.

Finally, I would congratulate the CIBSE Hong Kong Region for a fantastic event, and the CIBSE Hong Kong Awards 2021 winners for their success. Your hard work and dedication are acknowledged and appreciated. Many thanks to CIBSE Hong Kong Region, the Steering and Organising Committees, the Honorary Advisors, the Judging Panel and all of our sponsors for their support in making the Awards a tremendous success.

Ms Ruth CARTER
CIBSE, Chief Executive

Message from **CIBSE President (2021/22)**

The CIBSE Building Performance Awards (BPA), now in their 15th year in the UK, recognise the professionals and projects that demonstrate engineering excellence in the built environment. The CIBSE BPAs are the only awards that focus on measured performance outcomes, and not just design intent or performance specifications. All engineering professionals in the industry are provided with the opportunity to showcase and share best practice, values, applications and solutions to their peers.

On behalf of CIBSE I wholeheartedly welcome the second edition of the CIBSE Hong Kong Award Ceremony. It is only with excellent design, meticulous installation and rigorous evaluation that we can move forward sustainably. Teamwork between design consultants, contractors and facilities managers and operators, can facilitate excellent building performance.

The CIBSE Hong Kong Awards 2021 promotes the strength of building services engineering professionals and the trade, as well as collaboration with project teams. It is clear that construction and engineering services industries in Hong Kong have the vision to lead outstanding building services design, practices and performance. All the winning entrants today demonstrated engineering excellence in their projects; either in the design or installation. There is evidence of sustainability combined with health and wellbeing in the projects entered.

The winners of the Awards this year provide clear evidence that Hong Kong has a lot of potential and capability to excel in building performance and innovation in building services engineering.

My congratulations once again to the Awardees of the CIBSE Hong Kong Awards 2021. Many thanks to CIBSE Hong Kong Region, the Steering and Organising Committees, the Honorary Advisors, the Judging Panel and all of our sponsors for their support in making the Awards such a success.

Mr. Kevin KELLY
CIBSE, President (2021/22)

Message from **CIBSE Vice President (2021/22)**

Building Services Engineering profession is a vital backing to the sustainable growth of our economy and society by application of innovative and smart energy conservation systems through to all round green initiatives from improving human livings and meeting ESG requirements of corporations. The profession devoted significant efforts to invent and develop among various advanced technologies with them integrating scientifically with engineering design to many different user settings. With increasing needs of such know how the importance of our building services engineering professionals is greater than before.

In witnessing all the hard work and dedication of our professionals, the CIBSE Building Performance Awards (BPA) proudly present awards to recognise the building services engineering and industry practitioners in such endeavors. The BPA is an avenue for well shared and demonstrated best practices, technological knowledge, design concepts and their transformation to practical application, commissioning as well as up to the full operating buildings' performance cycle. Also, the BPA is leading the way in rewarding the proven and genuinely well performed buildings in use rather than merely focusing on design intent.

Added to this second time of the award taking place in CIBSE Hong Kong Region there is a newly created category related to dealing with COVID-19 pandemic which aims to provide good encouragement to professionals on their commitment over the recent challenging years by virtue of their building services engineering talents to minimise chances on the disease spreading. It has not along been easy but as seen these highly appreciable good achievements are good examples to showcase commitments of our fellow CIBSE members to the industry as well as to the community at large.

With the tremendous efforts made by the Organising Committee, Judging Panel and all of our Advisers, I am of confident that the CIBSE Hong Kong Awards 2021 is bringing all the distinct flavor of the built environment professionals together to promulgating and promoting good building efficiency, notable quality building performance and significant building operational savings by means of highly innovative and effective building services engineering installations and operations. These benefit all businesses across Hong Kong and contributing toward a well ESG performed society of ours.

I sincerely congratulate to all the Awardees of the CIBSE Hong Kong Awards 2021 for having the skills and courages to make this far, and certainly to each of the winners for their fine and remarkable pieces of works.

Prof. PL YUEN
CIBSE, Vice President (2021/22)

Message from
CIBSE Hong Kong Region Chair (2020/21)

The CIBSE Strategy 2020-2025 states our Commitments to drive better built environment performance, unlocking economic, environmental and social value. Specifically, we work to serve society in the built environment by:

- Stimulating demand for a better building performance
- Influencing others to seek improvement of the built environment
- Providing a hub for knowledge and innovation.

Our CIBSE Hong Kong Awards play an important role for the above commitments in not only demonstrating the importance of our building services engineers, but also in celebrating the positive impact that building services engineering has on our everyday lives. I am delighted that despite a difficult year with impact from COVID-19 pandemic for everyone, our building services engineers continued to safely deliver inspiring projects in often challenging circumstances

The CIBSE Hong Kong Awards aims to bring BS professionals together to offer innovative design, improve operational efficiency, enhance occupant satisfaction and building energy performance for the benefit of businesses and society. Our spirits are to connect and inspire the professionals by networking and presenting their best practices and innovative solutions to the industry.

We had very encouraging results in CIBSE Hong Kong Awards 2019. Without doubt, we also received comments and recommendations from the HK industry and the UK Headquarters. We had carefully considered the comments and incorporated into the CIBSE Hong Kong Awards 2021. Besides recognising the engineering excellence in Building construction and Facility Management industries, a new category was added in the Awards to recognise the professionals for their contribution and achievement in combat of the outbreak of COVID-19.

I congratulate to the winners of the CIBSE Hong Kong Awards 2021 for their profound achievements. No less important, I would like to extend my sincerest gratitude to the Judging Panel, Steering Committee and the Organising Committee for their devotion to make the Awards so success to the building services industry.

Mr. Keith MA
Chair, CIBSE Hong Kong Region (2020/21)

Message from
CIBSE Hong Kong Region Chair (2021/22)

Congratulaory Messgae to CIBSE Hong Kong Award 2021

My heartiest congratulations to the CIBSE Hong Kong Region on the continued success of the CIBSE Hong Kong Awards 2021. Since 2019, the Awards have recognised many professional organisations for their excellence in developing and implementing the energy and sustainability management as well as innovative technology to drive a better building performance.

Through CIBSE Hong Kong Award, the innovative efforts of our building services engineers are acknowledged. The winners and all participants have demonstrated their commitment in developing and promoting of a positive impact on the design, installation, commissioning and operations of buildings.

Without doubt, the COVID-19 pandemic has actually created huge challenges for people. It was a very challenging moment last year but as a professional building services engineer as well as CIBSE member, we have demonstrated our rapid response to transform the challenge to a more innovative, comfortable, safe and resilient facilities and systems to help people for improving the built environment that is fit for the "New Normal". I am very glad to learn that a new category of COVID-19 has been created this year to recognise our building service engineers professionals for their contributions over the challenging year to combat the effects of COVID-19.

The CIBSE Hong Kong Award was initiated in 2019, we have noticed the number of entries growing this time and all have been submitted by various organisations. It has explained the recognition and importance of CIBSE Hong Kong Award in the industry. Through the joint efforts by Government, industry and academia, we can foster a vibrant innovation culture in our industry and community.

Last but not least, I would like to extend my warmest congratulations to all Awardees for their exceptional and innvoative works, and hope that the Awards will encourage the professionals to continue their commitment by promoting innvoation, energy efficiency, awareness about sustainable development, its wide applications and its benefits to the community. I would also take this opportunity to express my heartfelt thanks to all the members, sponsors, judging panel, steering committee and the organising committee for their hard work and contribution to make the Awards a successful and remarkable event.

Mr. Vincent MA
Chair, CIBSE Hong Kong Region (2021/22)

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Dr. Horace MUI
Associate Head of Department & Associate Professor
Department of Building Services Engineering, Hong Kong Polytechnic University

Mr. Vincent MA
Chair, CIBSE Hong Kong Region (2021/22)

Finalists for the CIBSE Hong Kong Awards 2021

PROJECT OF THE YEAR AWARD – PUBLIC USE BUILDING

- Tin Shui Wai Hospital
- West Kowloon Government Offices

PROJECT OF THE YEAR AWARD – COMMERCIAL / INDUSTRIAL BUILDING

- Hong Kong Science Park Expansion Stage 1
- One Hennessy
- Port 33

PROJECT OF THE YEAR AWARD – RESIDENTIAL BUILDING

- University Heights
- Wah Ha Estate (Chai Wan Factory Estate)

PROJECT OF THE YEAR AWARD – RETROFIT BUILDING

- Retrofitting Works at Park Central Shopping Arcade
- The Mills

FACILITIES MANAGEMENT TEAM AWARD

- Hongkong Land Central Portfolio Property Management Team
- Shanghai Street 618 Sustainable FM Approach for Operation and Maintenance
- Three Garden Road
- V city

COVID–19 ACHIEVEMENT AWARD

- 8 Waterloo Road
- Citi Tower
- Excel Centre
- Future-Proofing the Health of Central
- Harbour North
- International Commerce Centre
- Manhattan Hill
- Metroplaza
- Neuron Health
- Nina Mall
- North Lantau Hospital Hong Kong Infection Control Centre
- Peak One
- Prima Villa
- Royal Peninsula
- Sham Wan Towers
- St Martin
- St Moritz
- V city
- Valais
- Victoria Harbour

Winners - the CIBSE Hong Kong Awards 2021

PROJECT OF THE YEAR AWARD – PUBLIC USE BUILDING

> West Kowloon Government Offices

PROJECT OF THE YEAR AWARD – COMMERCIAL / INDUSTRIAL BUILDING

> Hong Kong Science Park Expansion Stage 1

PROJECT OF THE YEAR AWARD – RESIDENTIAL BUILDING

> University Heights

> Wah Ha Estate (Chai Wan Factory Estate)

PROJECT OF THE YEAR AWARD – RETROFIT BUILDING

> The Mills

FACILITIES MANAGEMENT TEAM AWARD

> Hongkong Land Central Portfolio Property Management Team

COVID–19 ACHIEVEMENT AWARD

> Future-Proofing the Health of Central

> Neuron Health

> North Lantau Hospital Hong Kong Infection Control Centre

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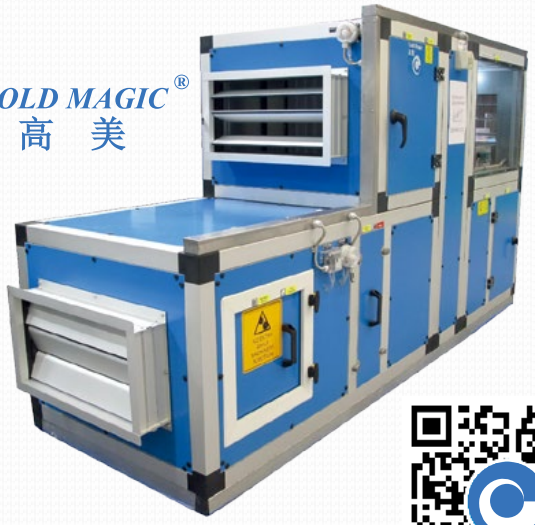

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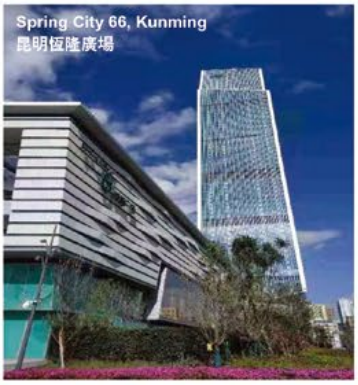
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The rise of PropTech

PropTech brings innovative solutions for construction, design, property management, testing and property transactions that disrupted industry development. In terms of property management, intelligence monitoring system helps to ease the problems in security guards, such as understaffed and aging staff, while technology can also help to reduce energy consumption in properties and operations to contribute to the environment.

The First and Foremost IoT Project for Facility Management in Hong Kong

Keysen saw the opportunity to improve energy usage with the reduction of ventilation rate at Three Garden Road's carpark. Led with Digital Transformation and Innovation team of the Company Group, the application of Internet of Thing (IoT) technology to Demand Control Ventilation in carpark was launched in July 2019, aiming to reduce operational and energy costs and enhance operational efficiency, while maintaining the indoor air quality of the carpark and experience of its users.

Three Garden Road is a modern glass and steel commercial complex located at the heart of Hong Kong's vibrant financial center

It is a technical advancement towards the facility management industry in Hong Kong with its LPWAN (Low Powered Wide Area Network) technology. Nonetheless, it is the first and foremost project in Hong Kong to achieve "Smart Building" by using this network and successfully integrated sensors data to local building monitoring surveillance system for Carpark Ventilation System for Big Data analysis, reaping the benefits of automation and environmental friendliness.

Successfully Achieved Annual Energy Reduction of Over 50% in 2020

An energy saving of 605,195kWh, equivalent to over 50%, has been recorded at Three Garden Road's carpark in 2020 with payback period of 2.4 years, facilitating significant energy savings and applications of PropTech without sacrificing air quality of the carpark.


34 sets of IoT temperature and CO sensors (right) and 27 nos of VSD panels for ventilation fans (left) are installed at Three Garden Road's carpark

Looking ahead, Keysen will continuously make strategic efforts to integrate sustainability into its services provided to enhance customer experience and to cope with climate change.

PROJECT OF THE YEAR AWARD – PUBLIC USE BUILDING

WINNER :

WEST KOWLOON GOVERNMENT OFFICES
Organisation: Architectural Services Department and Electrical and Mechanical Services Department

建築署 Architectural Services Department

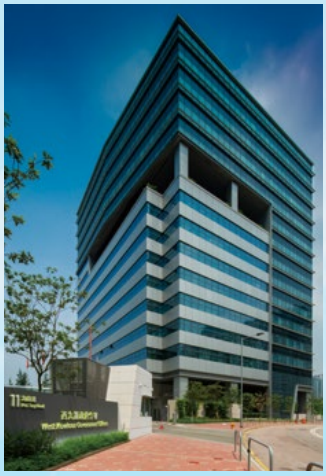
機電工程署 EMSD

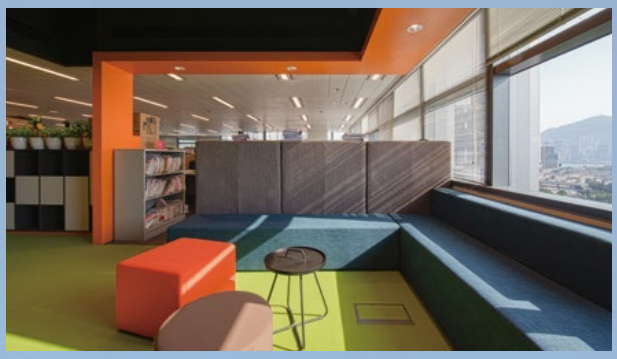
West Kowloon Government Offices (WKGO) was designed to outperform the statutory energy efficiency requirements and minimum green building performance of the government building. The building has adopted various passive and active sustainable design features in achieving the goal.

The building design had adopted the overall energy approach to achieve the outstanding performance, i.e. minimise energy input, adoption of high energy efficient equipment and reclaim waste energy as far as possible. The building envelope was designed to have a lower than usual Overall Thermal Transfer Value (OTTV) to minimise the cooling demand. To conserve energy for services, high energy performance water-cooled chiller plant with optimisation control, electronically commuted (EC) variable speed plug fan air-handling units (AHU), occupancy-based demand control, low lighting power density by using task lighting design approach, light emitting diode (LED) lighting, lift power regeneration and service-on-demand escalators were designed. To encourage the use of natural light for energy saving, daylight sensors were designed in the parameter zones to control the artificial lighting level. To reclaim waste energy, heat recovery wheel was designed to minimise energy demand. Renewable energy system design includes a 10-kW grid-connected photovoltaic (PV) and solar water heating system which contribute around 0.5% of the total annual building energy consumption. The building energy simulation result revealed that an energy reduction of 41.9% could be achieved when comparing with the baseline model of similar building.

Aim at providing remarkable indoor environment for occupant wellbeing, the building layout design adopted a new model of modern workplace that fosters staff interaction and well-being. "Connecting Spaces" were ergonomically designed to encourage socialisation and interaction. Healthy staircase is available connecting directly with the passenger's lift lobby to encourage users to use staircase for vertical circulation. Solar shading device and internal blinds were provided for comfort. A landscape garden on the ground level with planters, landscape decks and communal spaces were designed throughout the development to create "break away" space for the offices. Rainwater harvesting system and dual flushing devices were also designed to conserve fresh water. "Excellent" class indoor air quality was achieved which ensured the imperative healthy environment of the building.

Building Energy Management System (BEMS) was designed in the building to collect, monitor and analyse the annual energy consumption of the building and its major building services installations. The BEMS facilitates the occupying departments to get





familiar with the energy consumption pattern, history and trend of energy consumption in respective accommodating areas for energy management. The BEMS also provided energy consumption breakdown information and profiles for various building services systems and major equipment. The generated energy consumption breakdown summary was useful in performing system energy performance evaluation, energy audit, retro-commissioning and system optimisation. The BEMS comprised of digital network analysers for every incoming and outgoing circuits at the low voltage cubicle switchboards, tee-off power supply to the areas of various accommodating departments and the major energy consuming system /equipment such as central chilled water plant, chillers, air-handling units, pumps, lifts, escalators, etc. According to the energy data collected from BEMS, the annual energy consumption of the building is 564 MJ/m²/annum (rolling averaged).

To facilitate the sustainable energy saving of the building in its life cycle, the on-going commissioning of major system so as to maintain the optimal operation is important. The building semantic Artificial Intelligence (A.I.) technology and big data analytics technology was applied. A semantic A.I. model has been built for the central chiller plant to encapsulate the operating data of the system from iBMS and BIM. The interval and naming convention of data were structured in machine-readable format, which enable the programmatic exploration of various operating data of the system. It sets the foundations for quicker and easier A.I. development and deployment on chiller optimisation models. By automated the collection of massive operational data of the central chiller plant, big data analytics has been applied to replicate the performance characteristics of chillers for on-going energy analysis for optimisation and predictive maintenance upon detection of abnormality.

With adopting semantic AI model in this project, the cooling load prediction model and COP prediction model were developed to support the on-going commissioning for energy and cost saving throughout the building operational stage. By using the predicted cooling load models and Coefficient of Performance (COP) models of the chillers, the chiller sequencing and operational settings could be optimised for energy and cost saving. The estimated COP improvement and the energy saving are shown in the following graphs. The anticipated energy saving by forecasting the cooling load and optimal chiller sequencing model is over 20% in average.

The building semantic A.I. technology has won the Gold Medals of the International Exhibition of Inventions of Geneva in March 2021. And WKGO has been accredited with the highest "Platinum" rating under the BEAM Plus (New Building) Version 1.2 certification scheme in September 2020.

ORGANISATION:
Architectural Services Department and Electrical and Mechanical Services Department

PROJECT ADDRESS:
11 Hoi Ting Road, Yau Ma Tei, Kowloon

PROJECT TEAM:
Building Services Engineer : J. Roger Preston
Building Developer / Owner : Government Property Agency
Project Manager : Architectural Services Department
Quantity Surveyor : C.S Toh & Sons & Associates
Structural Engineer : Siu Yin Wai & Associates
Architect : Andrew Lee King Fun & Associates Architects
Sustainable Design Consultant : Environ Hong Kong
MVAC Contractor : Young's Engineering
Electrical Contractor : Majestic Engineering
Fire Services Contractor : Far East Engineering Services
P&D Contractor : Majestic Engineering
Main Contractor : Hip Hing Joint Venture
Facilities Manager : Urban Group
O&M Agent : Electrical and Mechanical Services Department

PROJECT OF THE YEAR AWARD – PUBLIC USE BUILDING

MERIT :

TIN SHUI WAI HOSPITAL

Organisation: Architectural Services Department

建築署
Architectural Services Department

Tin Shui Wai Hospital (TSWH) is a new hospital built to meet the population growth and medical needs in the New Territories West Cluster of the Hong Kong Special Administrative Region (HKSAR). TSWH was substantially completed in 2016, the owner (i.e. Hospital Authority) was gradually moved-in and was put into operation by phases from early 2017. This is a 10-storey hospital building with a single-storey basement car park, it serves as a main medical institution in this district. Patients in Tin Shui Wai were no longer required to attend hospitals in other Cluster, which brings a great convenience to the residents for the community.

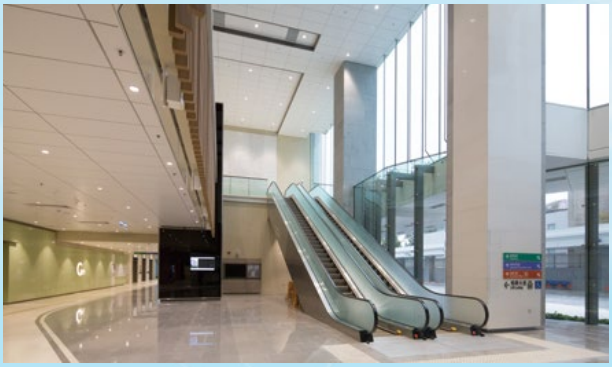
As the main medical institution in Tin Shui Wai, this hospital was designed not only to meet the public and medical professional's needs in respect of system reliability and public heath safety, but also with various Energy Efficient Technology (EET) and Renewable Energy Technology (RET) features introduced aiming to reduce operating cost and carbon emission.

During the planning stage, several reliable building services systems were designed to maintain an uninterrupted services for the hospital. For example, ring main circuits with double end feed power supply, standby system and essential power supply for backup purpose, dual feed distribution network within building, remote failure signal and alarm to alert the hospital maintenance for swiftly overhaul etc.

Throughout the entire project development process until the final handover stage, emergency plan, operation & maintenance manuals and trainings etc. were well established for the operation team to deal with any possible services breakdown or emergency situation such as power failure and flooding, etc. To further enhance the system reliability, routine testing and commissioning with preventive maintenance was also carried out regularly during the post occupancy period.

Public health concern on hygiene and infection control was also critical considered in the building services design. To maintain a safe indoor environment and facilitate effective operational needs, design team had paid a lot of efforts in building services design. For example, define hygiene zoning and logistic flows, plan in layout to confine the source of contaminant and design effective ventilation for rapid control and dilution/ removal of contaminant, implement automation to minimise direct contact etc.

In view of sustainable development, TSWH was also designed as a high energy efficient building by applying a wide range of EET and RET. The annual energy consumption was merely reached 1,377.6 MJ/m²/annum during the post-occupancy period, which was at the 10th percentile of the same building group in the record of other hospital projects



in accordance with energy utilisation indexes and benchmarking tools by EMSD.

By learning the painful experience of the outbreak of Severe Acute Respiratory Syndrome (SARS) in 2003, the performance standard and design arrangement for building services installations in hospital have been greatly improved in order to uplifting the infection control requirement. No matter the outbreak of SARS or other infectious disease, the first priority in hospital is to provide reliable building services systems and to assure the health and safe operation. Striking a balance between infection control, system reliability and energy conservation is the major challenge for this project.

In parallel with the implementation of energy monitoring strategies, automation for different building services system was also applied so as to optimise the system performance and reduce the carbon footprint as follow:-

a) Automatic control of chiller plant by means of pre-set control logic built into the Central Control and Monitoring System (CCMS) was implemented to suit for actual chilled water demand;

b) Automatic demand-driven ventilation was utilised in car park areas for fan speed control by means of pre-set CO and NO_2 concentration;

c) Timer schedules written onto CCMS system for the control of ventilation operation;

d) Automatic Irrigation system with integration of rainfall monitoring (rain check) to control irrigation capacity that requires for dry and rainy days; and

e) Automatic Lighting Control System (LCS) was provided for the control of the entire lighting (indoor/outdoor) system in form of timer, occupancy sensor and daylight sensor etc.

The way to contribute the achievement of the intended building performance is to deliver the design intend and operation details to both users and maintenance personnel, such that the building service installation could be can operated as expected. Frequent communication with user and maintenance personnel is also an alternative way to familiarise their needs during the actual building operation. Provide recommendation or fine tune the building services system to suit the user's updated requirement if needed.

Post Occupancy Evaluation (POE) exercise was carried out in 2018 for the sake of monitoring the defect rectification progress, evaluating the building energy performance against the design criterion and providing recommendations on energy saving measures. A client satisfaction survey was also conducted to evaluate client's feedback in regarding the performance and operation of major building services installations. To attend user's and maintenance agent's feedback immediately, meeting were held regularly to have a close communication.

In April 2019, TSWH has been accredited with the highest "Platinum" rating under the BEAM Plus (New Building) Version 1.2 certification scheme and achieved the "excellent class" under the Indoor Air Quality Certification Scheme.

ORGANISATION:
Architectural Services Department

PROJECT ADDRESS:
11 Tin Tan Street, Tin Shui Wai, N.T.

PROJECT TEAM:
Building Services Engineer : Arup
Building Developer / Owner : Hospital Authority
Project Manager : Architectural Services Department
Quantity Surveyor : C.S Toh & Sons & Associates
Architect : Simon Kwan & Associates
MVAC Contractor : Hsin Chong Aster Building Services
Electrical Contractor : Leighton M&E
BMS Contractor : Hsin Chong Aster Building Services
ELV / ICT Contractor : Access Control Systems
Fire Services Contractor : Chubb Hong Kong
P&D Contractor : Leighton - Able Joint Venture
Main Contractor : Leighton - Able Joint Venture
Facilities Manager : Hospital Authority

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Being a member of Sun Hung Kai Properties Group (SHKP), Hong Yip remains one of the largest property and facility management companies in Hong Kong. We are now managing around 1,600 individual building blocks, ranging from private estates and luxurious houses, commercial and industrial buildings, shopping centres, to government and school facilities. Sharing SHKP's commitment to "Building Homes with Heart" and Hong Yip's motto "Serving Customers with Heart", we aim to provide ultimate management service with the integration of advanced technology and environmental protection management. Hong Yip will continue to provide a better living environment, to create a better lifestyle, and to build a better community for customers to enjoy.

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PROJECT OF THE YEAR AWARD – COMMERCIAL / INDUSTRIAL BUILDING

WINNER :

HONG KONG SCIENCE PARK EXPANSION STAGE 1
Organisation: Hong Kong Science and Technology Parks Corporation

Hong Kong Science Park Expansion Stage 1 consists of two tower blocks with a common podium designed for research laboratories and offices. The building design is aimed to providing a healthy, user friendly environment with smart facilities for innovation companies and researchers. A 30m separation distance is kept between the 2 tower blocks to allow for a breezeway for urban air ventilation. The project conducted CFD analysis to determine the orientation and location of the buildings. Sunlight, daylight and wind effects were modelled during the planning stage to provide energy efficient and pleasant environment for the occupants.

It was a big challenge of coordination between architectural plan, structure and MEP to provide a flexible design of building plan and building services provisions that can adapt to changes of layout and usage in order to reduce waste. As a result, in harmony with the façade design, external louvres were reserved along the façade for flexible intake air duct and exhaust air duct connection to allow maximum flexibility for different sizes of laboratory tenants. Sunken trenches were reserved for laboratory waste water connection to below without entering tenant area of the floors below. A chimney shaft was reserved to allow maximum flexibility for laboratory tenants to install fume cupboard exhaust duct to the roof exhaust fans. This allows for flexibility for any future changes to the usage of lower floors.

To achieve high power supply reliability, two separate electrical rising mains are provided for each tower from each transformer such that power supply shall not totally loss in a single point failure of the power distribution system. Furthermore, essential power with diesel generator back-up is provided for tenant's server, laboratory equipment as well as security systems, BMS and essential air-conditioning system. Double-end feed water and power supply from utility companies are provided to ensure the stable water and power supply to the building which is essential to R&D researchers and experiment in the laboratories.

Centralised supply of technical gas and liquids (e.g. N_2, CO_2, 4 Bar / 7 Bar compressed air and purified water) and metering facilities are provided to facilitate laboratory activities. Specialised chemical neutralisation plant is also provided for treatment of chemical waste sewage discharged from the bio-technology laboratories

As the existing district cooling system of the science park campus did not have sufficient capacity for the two new building blocks, a separate central water cooled chiller plant was designed and installed at the podium level of the new development to maximise usable space as much as possible. In order to maximise the flexibility of sub-division of offices and to provide energy efficient overtime operation of small units, the numbers of air handling units and the zoning of the air conditioning system is optimised on each typical office floor. Ionisers and UV sterilising lamp are provided at each AHU to achieve good indoor air quality.

High efficient water-cooled central chiller plant, heat pump are adapted to the building's air conditioning system. The water to water heat pump can provide cooling and heating simultaneously for dehumidification. Modular integrated air handling units (AHU) with high efficient variable speed EC plug fan are provided for supply air distribution, UV and air purifiers are also provided to enhance health and hygiene of the indoor environment.

Photovoltaic solar energy system and green roof garden are provided on the roof of the buildings to enhance the wellbeing, productivity and environmental sustainability of the building and the occupants.

The intelligent lift destination control system integrated with access control system is also providing convenient and secure vertical transportation to visitors, staffs as well as delivery and services robots. The lift motor system is equipped with VVVF and regenerative braking system to retrieve braking power and reduce energy use of the lifts. The escalators are also provided with energy saving operation such that the escalator will slow down and shut down automatically when there is no passenger.

A Building Management System (BMS) is installed to facilitate the effective operation of building services systems. Individual energy meters are installed for various systems (e.g. Air-conditioning and lighting serving the landlord areas such as lobby, retail and to monitor their energy consumption, which help to identify energy management opportunities (EMOs) for reducing the energy use. All building services systems are controlled by the building management system, the system control all building services installations to operate in accordance with the pre-set time schedule, sensor set point and feedback. The chiller plant control is optimised to control the operation sequence of the chillers and cooling tower fan speed to run at the highest efficiency. It also facilitates the facility manager to monitor the trend and input time schedule for system operation. According to BMS data log, the majority of energy use of the building is air conditioning system including chiller plant, cooling towers, AHU, ventilation fans. The second large energy use was consumed by lighting system and the plumbing system is the third large energy consumption. It is around 30% less energy demand compared with the benchmark building of the same type without the energy saving measures adapted in this development.

The testing and commissioning of building services systems was supervised by the resident site staff and site engineer/ inspector and an independent T&C auditor before handover to ensure the workmanship, function and system optimisation of the system are in order and able to achieve the design intend in accordance with the contract documents, specifications and drawings. All the test results were properly recorded in the specific commissioning report forms in both softcopy and hardcopy format.

ORGANISATION:
Hong Kong Science and Technology Parks Corporation

PROJECT ADDRESS:
Building 17W & Building 19W, Science Park West Avenue, HKSTP, Shatin, N.T.

PROJECT TEAM:
Building Services Engineer : J. Roger Preston
Building Developer / Owner : Hong Kong Science and Technology Parks Corporation
Project Manager : Hong Kong Science and Technology Parks Corporation
Quantity Surveyor : Beria
Architect : Wong Tung & Partners
Sustainable Design Consultant : Ramboll Hong Kong
MVAC Contractor : ATAL Engineering
Electrical Contractor : ATAL Engineering
BMS Contractor : ATAL Engineering
ELV / ICT Contractor : Nixon Technology
Fire Services Contractor : ATAL Engineering
P&D Contractor : ATAL Engineering
Main Contractor : Hip Hing Joint Venture
Facilities Manager : Urban Property Management

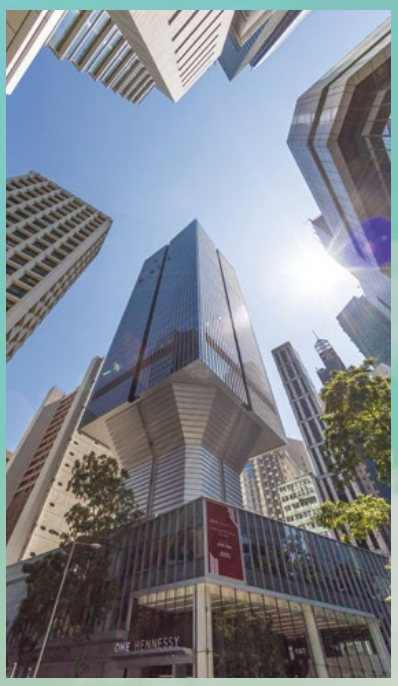
PROJECT OF THE YEAR AWARD – COMMERCIAL / INDUSTRIAL BUILDING

MERIT :

ONE HENNESSY

Organisation: Chinachem Group

CHINACHEM GROUP
華懋集團



One Hennessy is redevelopment project of old Asian House building. It is a Grade A office building. It offers a top-of-the-class office accommodation with amenities that compliment modern lifestyle. The design of One Hennessy is to contribute to the Wan Chai neighbourhood.

One Hennessy was attempted to raise the office tower in 30m high from podium roof to encourage urban ventilation and alleviate pollution at Wan Chai district. A distinctive funnel shape at the bottom of the tower that sits on top of the podium is designed to facilitate natural lighting and ventilate airflow onto the street level to avoid screening effect in the neighbourhood. One Hennessy is not only a design statement but also serves an environmental purpose by improving ventilation.

The high-performance curtain wall system with low-emissivity double glazing and high-level openable window is applied in One Hennessy. It allows sufficient visible light entering the office area while reducing unwanted solar heat gain enhance cross ventilation and exterior noise at the same time. Installation of sheer screen and blackout screen at office typical floors allows flexible use of drape in different daylight condition for occupants' comfort.

Apart from low-emissivity double glazing curtain wall system, electric vehicle chargers are available every parking space to encourage the use of electric eco-friendly vehicles. Furthermore, bike racks are installed to encourage the building users to cycle to One Hennessy so that to reduce the demand for motor vehicle parking and the use of vehicles on road to ease the traffic congestion, thus reducing carbon emissions and promoting sustainable life thereby.

One of the project challenges is complicated underground conditions. One Hennessy is located in one of the busiest and most comprehensive transport networks in Wan Chai. The complex underground services network made underground utilities construction works extremely difficult. Building Information Modelling (BIM) was utilised to demonstrate the spatial relationship between existing infrastructures, services pipework and the proposed new works. BIM had also improved the design of proper retaining and excavation method and ensured safety at works.

The project adopted BIM, Design for Manufacture and Assembly (DfMA) design approach, and Modular Integrated Construction (MiC) innovation approach. DfMA and the MiC were both adopted for MVAC installation of riser pipes, chiller and AHU plants in One Hennessy. Free standing integrated pre-finished modules were prefabricated in factory before transporting to the site for installation. The modularisation benefited the program by allowing advanced works to prefabricate off site, which reduced the

subsequent site activities and time on site. This, in turn, also helped to provide a better site environment control.

Metering devices are provided for the building operator to monitor the facility's operational condition. A high-efficiency chiller with variable speed drive motor, energy efficiency lighting installations, MERV14 filter at AHUs & PAUs and UV light steriliser light at office AHUs were also specially adapted for the building, which has achieved an excellent reduction in energy consumption, and has significantly improved indoor environmental quality. The annual energy saving for the project is about 26% compared to the ASHRAE baseline. In addition, Power Management System (PMS) and Building Management System (BMS) was fully utilised in One Hennessy. PMS assured the safety and efficiency of the electrical system. It is shown and record real-time monitoring power consumption. The building operator monitors, analyzes and reviews data of power consumption for energy saving.

An independent Commissioning Authority (iCxA) was appointed to verify the proper operation of the commissioned systems. This ensured that the building operator keeps the equipment operating under the desired conditions. For instance, metering devices are provided for the building operator to monitor the facility's operational condition. To keep the equipment working under desired condition, such metering devices are kept on monitoring the facility operation condition. The iCxA has been involved in the project from the design stage, all T&C related issues have been well noted and solved from the design to construction to ensure the soft landing for the equipment operation. Besides, the system manual (energy management manual) was developed for further facilities manager. The iCxA has verified proper operation of commissioned systems and that the requirements set forth by the owner are achieved.

In One Hennessy, customer survey with respect to building environment, facilities provision, customer services satisfaction, security level etc. and guest comment would be collected for periodic review. Through customers and users' suggestions and opinions, the service quality and service level could be improved, and thus to provide a better service to gain the trust and praise from them.

With a great effort on sustainable design, One Hennessy is awarded with vaiours local and international awards.

ORGANISATION:
Chinachem Group

PROJECT ADDRESS:
No.1 Hennessy Road, Wan Chai, Hong Kong

PROJECT TEAM:
Building Services Engineer : J. Roger Preston
Building Developer / Owner : Bonny Ace
Project Manager : Bonny Ace
Quantity Surveyor : Arcadis Hong Kong
Architect : DLN Architects
Sustainable Design Consultant : Allied Environmental Consultants
Environmental Consultant : Allied Environmental Consultants
Façade Consultant : Arup
Traffic Consultant : MVA Hong Kong
Landscape Architect : Earthasia
Lighting Designer : Arup
Interior Designer : DLN Architects
MVAC Contractor : Gammon E&M
Electrical Contractor : Gammon E&M
BMS Contractor : Gammon E&M
ELV / ICT Contractor : Chubb Hong Kong
Fire Services Contractor : Shun Hing Engineering Contracting
P&D Contractor : Aires Engineering
Main Contractor : CR Construction
Facilities Manager : Sources Fame Management

PROJECT OF THE YEAR AWARD – COMMERCIAL / INDUSTRIAL BUILDING

MERIT :

PORT 33

Organisation: Hong Yip Service

Port 33, a brand-new development project at San Po Kong, strategically located aside to the Kowloon East development area, which was developed by Sun Hung Kai Properties with a total gross area of 263,000 square feet. This 26-storey prime development consists of 18 floors office, 4 floors shops, and 4 floors car parking area, connected to the heart of Kowloon. It is classified as an excellent Grade A complex of office and retail spaces.

Sustainable designs and measures are being adopted in the building as green building strategies. It's the first time that a sun-light capture system, SOLARIS lamps, is installed to encourage the use of natural resources instead of artificial lighting. These automatic daylight convertors require no power source, and controls the light reflection angle from the rooftop into the light well, which is the characteristic feature of Port 33. In addition to the eco- lighting, the lightings applied in the development are energy efficiency appliances, for instance, LED tubes and motion sensor lights are being used in common area which followed the guideline of Building Energy Code (BEC), granted in 2018.

More than light, Low-E double glazing windows are installed as curtain wall for each office unit to reduce heat transmission, in order to reduce energy use for air-conditioning. Light well was specially design to allow natural daylight penetration and natural ventilation at office floors. West side of light well's top has 10m high wall which acts as "wind catcher", contributing to catch the wind breeze from the east. The captured wind is forced down through light well and brought into each office floor by opening windows. Openable windows at the light well and building façade encourages tenants to have natural ventilation by convection, and consume less energy for air conditioning. Furthermore, a rainwater recycling system is installed for harvesting and irrigation of the green area to attain rainwater utilisation. In basement carpark, all parking spaces provided electric vehicle (EV) charger for public use, encouraged the use of electric vehicles and a low carbon lifestyle.

Development has adopted the below energy saving and carbon reduction measures to achieve energy saving:

1. Better Window-to-Wall Ratio
2. High efficient MVAC system with water cooled chillers and comprehensive BMS and PQMS system
3. Variable speed for cooling tower fans
4. Variable speed for chilled water pumps
5. High efficiency for pumps
6. Adoption of FCU with lower W/l/s with respect to VAV system of baseline for office tower
7. Variable speed escalator and VVVF Lift
8. High efficient lighting with LED and T5 with motion sensors and timer control

9. Lower LPD for most of office area and carpark
10. Modular and standardised design for structural, façade, architectural and building service elements were adopted to enhance buildability and reduce waste during construction.

To verify the effectiveness of the light well, the Architectural Design of the project – Nikken Sekkei had carried out researches and on-site measurement after project completion to monitor the efficiency of light well, to make necessary adjustment to ensure that the design works.

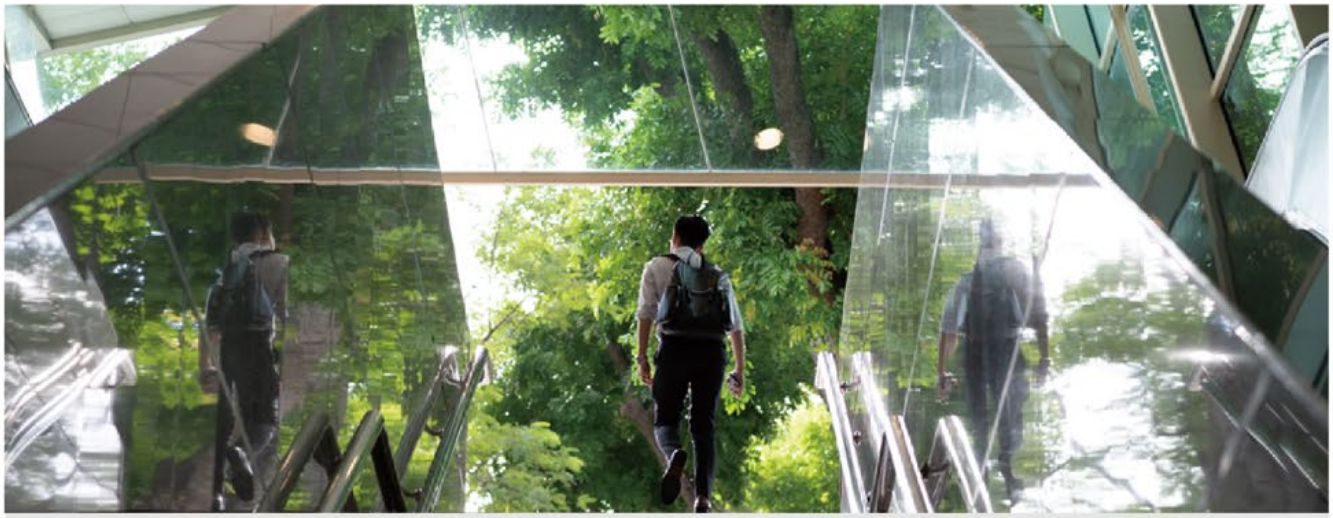
The facility management team implements green property management into daily operations and adopts IoT technology for monitoring building facilities intelligently to reduce energy consumption and to maintain an optimal level of operation.

For energy control, Building Management System (BMS) and Nitrol security system controlled and monitored major equipment such as air-conditioning and lightings. Mixing with the Power Quality Measurement System (PQMS), it allows management to monitor the electricity consumption closely. Port 33 was certified with ISO50001 energy management system in 2020. For intellectual management solutions, a smartphone application, SopropBiz, had been adopted to provide latest information to tenants at PORT 33, which saving copies of notices and promote security. Another inhouse mobile app., IntelliNet 4.0, is using for monitoring water leakage alarm system, indoor air temperature monitoring (IAQ) and door opening alarm, etc. With these facilities management, Port 33 achieved an all rounded green management from the building hardware to each tenant working style.

ORGANISATION:
Hong Yip Service

PROJECT ADDRESS:
33 Tseuk Luk Street, San Po Kong, Kowloon

PROJECT TEAM:
Building Services Engineer : J. Roger Preston
Building Developer / Owner : Century Property Investment
Project Manager : Sun Hung Kai Real Estate Agency
Architect : Sun Hung Kai Architects and Engineers
Architectural Designer : Nikken Sekkei
Structural and Civil Engineer: Arup
Environmental Consultant : Allied Environmental Consultants
Façade Consultant : Alpha Consulting
Landscape Architect : Sun Hung Kai Architects and Engineers
MVAC Contractor : Lik Kai Engineering
Electrical Contractor : Lik Kai Engineering
BMS Contractor : Lik Kai Engineering
ELV / ICT Contractor : Lik On Security
Fire Services Contractor : Lik Kai Engineering
P&D Contractor : Lik Kai Engineering
Main Contractor : Yee Fai Construction
Facilities Manager : Hong Yip Service



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PROJECT OF THE YEAR AWARD – RESIDENTIAL BUILDING

WINNER :

UNIVERSITY HEIGHTS

Organisation: Chinachem Group

CHINACHEM GROUP
華懋集團

The site of 4,865sqm is located on the northern slopes of Lung Fu Shan with 75 residential units, at the point where the dense urban development of Central and Sheung Wan meets the steeply sloping natural wooded hillsides that lead up to the Peak. The elevated site has spectacular westerly views over the attractive grounds of the neighbouring University of Hong Kong towards the western reaches of Victoria Harbour and Lantau Island beyond. The site enjoys unobstructed sea view of Victoria Harbour overlooking Tsing Ma Bridge, Stonecutter's Bridge & the University of Hong Kong. There are several constrains from the project to balance the neighbor environment and the proposed development. The project team put serious concern on the sustainable site and the below elements are considered in the design solutions :

- 100% of car parking spaces are equipped with medium EV charger.
- The site planning and design of University Heights achieved over 100% of the Urban Design Guidelines sub-items, demonstrate excellent work on enhancement of the site and its surrounding neighbourhood.
- More than 50% of the roof are covered by tiles of high solar reflectance index, lower the indirect solar heat gain inside the building as well as urban heat Island Effect.
- For exterior lighting design, the lighting pollution is minimised to residents and neighbourhood without compromising the aesthetic performance and intended functions.
- The contractors have implemented the appropriate mitigation measures and monthly monitoring on air, noise and effluent quality throughout the demolition, foundation and construction stages. All environmental qualities meet the statutory requirements throughout all 3 stages.

Besides, considering the site location and building orientation, the cooling load for the proposed project shall be relevant high, the below energy efficiency measures are adopted during the design to help the project to achieve the energy saving targets,

a) High Performance Glazing
High performance double glazing installed to reduce the solar heat gain to the building, which reduce the cooling energy used

b) High Energy Efficiency Air-conditioning System
High performance VRV is adopted for building tower.

c) Energy Saving Lighting System
Energy Saving Lamp (T5 fluorescent lamp, LED down light, LED strip) installed in clubhouse, lift lobby, carpark and public circulation areas.

d) Energy Saving Lift System
Variable Voltage Variable Frequency (VVVF) drive adopted in the lift system to reduce the energy used in vertical transport.

e) Façade with high resistance of indirect heat gain

More than 50% of the roof are covered by tiles of high solar reflectance index, lower the indirect solar heat gain inside the building as well as urban heat Island Effect.

The estimated annual energy saving (as well as carbon emission) of residential portion and carpark portion reaches 24.5% and 41.6% respectively compare with BEC statutory requirement through considerate design in building fabric and Building Services system. The remarkable saving in residential portion can be attributed to adoption of high energy efficiency equipment and façade design which lower indirect solar heat gain. Deliberate design in carpark lighting bring about 43% energy saving compared to BEC statutory allowance. The planning, execution, adjustment and record of testing and commissioning are reviewed and verified by Independent commissioning authority. Metering system with high accuracy are installed to monitor the energy consumption of major building services systems in common area. The actual energy consumption in 2020 of 985,572 kwh for main building and carpark is lower than the estimated energy consumption of 1,003,914.8 kwh by energy simulation.

To ensure the installations meet the intended performance, at the tender stage, Commissioning Specification of all major building service systems which detailing the commissioning requirements for all systems and equipment that impact on energy use and indoor environmental quality are developed for contractors to follow. Commissioning authority (CxA) and Independent Commissioning authority (iCxA) both with qualification Registered Professional Engineer and adequate expertise were engaged for reviewing project design to meet owner's requirement and construction document as well as develop the procedures and checklists of the functional test and verifying that the Commissioning Plan has met the owner's requirement and all findings in Commissioning Report respectively.

The CxA has been involved in the project from the design stage, all T&C related issues have been well noted and solved from the design to construction to ensure the soft landing for the equipment operation. Besides, the energy management manual was developed for further facilities manager. The CxA has verified proper operation of commissioned systems and that the requirements set forth by the owner are achieved.

Frontline staff collect opinions through daily contact with tenants and reflect the management team. Annual customer satisfaction survey by questionnaire including the follow aspect had been conducted. The management services survey questionnaire has been well design to collect the feedback from different stakeholders. The major concerns have been addressed in the building/estate, building management, facilities and overall performance.

ORGANISATION:
Chinachem Group

PROJECT ADDRESS:
No. 42 Kotewall Road, Mid Level, Hong Kong

PROJECT TEAM:
Building Services Engineer : Far East Consulting Engineers
Building Developer / Owner : University Heights Holding
Project Manager : Chinachem Group
Quantity Surveyor : Rider Levett Bucknall
Architect : Andrew Lee King Fun & Associates Architects
Sustainable Design Consultant : BeeXergy Consulting
Façade Consultant : AECOM Asia
Lighting Designer : Lightsource International
Interior Designer : VIA Architecture / Philip Liao
MVAC Contractor : Arnlee Engineering
Electrical Contractor : Huns Engineering
BMS Contractor : Huns Engineering
ELV / ICT Contractor : Huns Engineering
Fire Services Contractor : Shun Cheong Electrical Engineering
P&D Contractor : Kin Win Engineering
Main Contractor : China Overseas Building Construction
Facilities Manager : Sources Fame Management

PROJECT OF THE YEAR AWARD – RESIDENTIAL BUILDING

WINNER :

WAH HA ESTATE (CHAI WAN FACTORY ESTATE)

Organisation: Hong Kong Housing Authority

香港房屋委員會
Hong Kong Housing Authority

Wah Ha Estate comprising one domestic public housing block was converted from a historical 6-storey H-shaped factory block of Chai Wan Factory Estate (CWFE), which was originally constructed in 1959 and was granted Grade II Historic Building status by Antiquities Advisory Board (AAB). The Government announced the conversion in 2012 with an aim to increase and expedite the short term public housing supply. The project underwent an extremely fast track programme completed in 2016, providing 187 domestic flats with shops and carpark on ground floor.

This project aims to create a sustainable living environment from a derelict Grade II Historic Building that is subject to various site constraints and to maximise its development potential as well as to conserve its historical values.

Hong Kong Housing Authority (HA) sets an Energy Performance Indicator for reference in the design of public housing development. The target for communal areas adopted in the design stage for this project was 30 kWh/m². The design of CWFE's E&M systems complied with BEC 2012, and the actual designed indexes of some major installations were significantly lower than BEC requirements. The building design and BS systems promoted energy saving, resident caring and to ensure that the building achieves the designed green targets by adopting various design, some are unique in HA's projects :

a) Two-level lighting design for typical floor lift lobbies, corridors and staircases – Lighting level could be altered to suit resident's need, which on one hand can minimise the energy used for lighting, on the other hand can comply with the minimum lighting level requirement for Barrier Free Access. Normal lighting level of 30-50 lux is generally maintained, when residents require higher lighting level, they can press the manual button provided at strategic locations of lift lobby, or at entrance to each building wings to increase to 85 lux. Motion sensors were provided at staircase to increase lighting level when resident enters the staircase landing. Daylight responsive control by photo sensors was adopted for lightings at the open corridor and lightings near fenestrations at staircase/lift lobby. Motion sensor was also provided in refuse room at each floor to minimise energy use when the refuse room is not in use.

b) Lighting Power – Apart from adopting daylight as much as possible and energy efficient design, LED luminaires with Product Certificates were also adopted in this project as the first project in HA to roll out LED luminaries in public housing estate.

c) Lifts – (i) Using gearless lift with Variable Voltage Variable Frequency (VVVF) drive; (ii) Uninterrupted Lift Supply – lift supply circuit was specifically designed with independent change-over supply from emergency generator, such that during the statutory Periodic Inspection, Testing and Commissioning, when the main switchboard or essential supply switchboard needs to be temporarily suspended, some of the lifts could still be operated to maintain service for residents.

d) Reliable Water Supply – (i) Variable frequency drive motors were used to enhance energy efficiency; (ii) Twin water tank design with water tank divided into two separate compartments with separate pipework, such that water tank cleansing could be carried out in each compartment alternatively without interrupting water supply to residents.

e) Water Efficiency for Irrigation – Rainwater harvesting system (RWHS) was adopted to collect rainwater from the green roof of the building block and then filtered and sterilised for irrigation purpose. The RWHS helped reduce dependence on the water supply and burden of rainwater drainage.

f) Building Hygiene – Volume control and storage device was installed at G/F Refuse Service & Material Recovery Chamber (RS&MRC) to control the proper amount of refuse to be collected in each refuse storage bin to prevent refuse leakage. Ventilation fans with odour control filter were installed in the RS&MRC and the refuse room at each floor.

g) Acoustic Control – To mitigate noises impact from railway and road traffic, a special acoustic balcony was adopted for flats in vicinity of Chai Wan MTR Station and the habitable areas of those flats strategically oriented away from the sightline of the MTR station and roads.

h) ISO 50001 Energy Management System – The project fulfilled the ISO50001 Energy Management System requirements to reduce energy use and consumption. Energy Baseline was set, and the Energy Performance Indicator for this project was 30 kWh/m² for communal areas facilities.

i) Energy Management – Over 30 nos. multi-function electronic meters and kWh meters were provided in the electrical system to measure and monitor the energy performance. These meters were generally connected by network to the Smart Meter Monitoring & Energy Information Display System to record and analyse the data. Electricity, water and also gas consumption information were processed by a central system and displayed on a 49" TV display panel at the entrance lift lobby to raise the awareness of residents on conservation of resources and hence saving. Regular energy measurement was conducted by HA facility management team, information would be analyzed and benchmarked with specific Energy Performance Indicator. This ensures intended energy consumption is attained.

j) User Feedback – HA engaged independent term service providers to conduct Residents Surveys for every newly completed project (including this project) about a year after project completion in order to gauge residents' satisfaction levels as well as their opinions and expectations of the newly completed project. The findings were used for review of design and provisions.

ORGANISATION:
Hong Kong Housing Authority

PROJECT ADDRESS:
2 Kut Shing Street, Chai Wan, Hong Kong

PROJECT TEAM:
Building Services Engineer : Hong Kong Housing Authority
Building Developer / Owner : Hong Kong Housing Authority
Project Manager : Hong Kong Housing Authority
Quantity Surveyor : Turner & Townsend
Architect : Hong Kong Housing Authority
Electrical Contractor : REC Engineering
Fire Services Contractor : Lee Yu Kee Fire Protection
Main Contractor : Yau Lee Construction
Facilities Manager : Hong Kong Housing Authority

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PROJECT OF THE YEAR AWARD – RETROFIT BUILDING

WINNER :

THE MILLS

Organisation: Nan Fung Textiles Second Mills

The Mills was the flagship revitalisation project of Nan Fung Group, situated in the industrial area in Tsuen Wan and completed in Sept 2018. It aimed to preserve local history and textile-rooted identity of Tsuen Wan, bridging the technology gap between the old and new generations. The Mills marked a significant movement in the preservation of cultural heritage and the transformation of an industrial district into a multi-faceted community. The project conserved most of the original structures and introduced new elements by implementing the latest building technologies and designing the spaces specifically for the fashion and textile industry.

To commit sustainable, environmentally friendly and people-centric wellness at The Mills, 70% of the existing building structure was retained, with steel structural strengthening to meet the new standards of the prevailing building codes. The old timber doors, metal gates and equipment were "up-cycled" and incorporated back into the various elements of the new interior design, preserving the building's 60-plus years of history, lending their own distinctive charm to this cutting-edge development. It also significantly reduced the use of new construction materials and minimised the building's overall embodied energy.

A combination of passive and active system designs were tailor-made for this refurbishment project to achieve higher energy efficiency performance for combating the challenges and constraints of different climates. Curtain wall was integrated to enhance daylight penetration into the collaboration spaces. High-performance façade, combined with external shading devices, reduces the need for air-conditioning. New and high energy efficient water-cool air-conditioning system and demand control ventilation enhanced the overall energy efficiency. Efficient LED lighting were used in common areas to reduce lighting energy demand. These strategies had been achieved approximately 20% energy saving in comparison to a standard building.

Through mapping the carbon baseline and understanding the design standards, The Mills could design to lower building energy use and reduce carbon emission. Balancing the indoor air quality and thermal comfort was challenging at The Mills. The distribution zones of chiller water system were strategically demarcated to maintain thermal comfort and avoid over cooling. On top of conventional Building Management System (BMS), The Mills adopted a Proprietary IoT platform - Building Operation System (BOS), which integrated with BMS and various types of IoT sensors, allowing for real-time data collection, data storage and data monitoring. A tailor-made dashboard with different graphic selection in the format of line graphs/ pie chart/ gauge diagram will be established. The dashboard can be customised by the users inside the portal, it compromises of Building Sustainability Manager (BSM),

Chiller Analytic Manager (CAM), Energy and Resources Manager (ERM) for achieving the targeted energy saving at The Mills.

To ensure the good class indoor air quality and achieve the targeted energy saving, BMS integrated with BOS to improve the operation efficiency of the chiller plant and adjusted the setpoint automatically to reduce the energy use. Multiple Wireless IEQ sensors and IoT sensors were installed to monitor the indoor air quality and to display the temperature and relative humidity (RH) at The Mills. All data were recorded and fed back to the cloud platform system. Facility Management (FM) team could also use the existing BMS system to adjust the chiller operation to improve the humidity condition for specific tenant requirements. With the integration of BOS and BMS, the targeted energy saving can be reduced, and the good class of indoor air quality can be achieved at The Mills.

The Mills was completed the refurbishment works in 2018. There was around 6% further saving on landlord energy consumption after one-year operation. It shared the effectiveness of energy conservation measures adopted and the success of overall energy management at The Mills. By adopting the online energy benchmarking tool from EMSD, the energy performance of The Mills is better than 90% of the same type of premises (i.e. at ≤10th percentile).

Proper Operation & Maintenance (O&M) management is an important factor to maintain the sustainability features of the building. We input lot of sustainable O&M practices in the O&M manual and tenancy guidelines to enhance the operation in The Mills, which focuses on the actions of occupants, health & safety, comfort and productivity, with an understanding of the need for subsequent generations to reuse and recycle building components. Tenants and visitors were experiencing an extraordinary journey at The Mills where they can explore elements of "Old" and "New" and can be inspired throughout their journey.

To improve the efficiency and effectiveness of the operation and performance at The Mills, Indoor Environmental Quality and Satisfaction Survey was conducted annually since March 2020 to ensure the satisfaction level for the tenants. This coverage of survey ranged from the building cleanliness, lighting brightness, air temperature, indoor air quality as well as the aural comfort at the common area of corridors, lifts and toilets. Over 75% (37 / 49 tenants) returned their feedback. With reference to the result of survey, over 90% of respondent are satisfied or neutral attitudes with the building performance.

ORGANISATION:
Nan Fung Textiles Second Mills

PROJECT ADDRESS:
No. 45 Pak Tin Par Street, Tsuen Wan, N.T.

PROJECT TEAM:
Building Services Engineer : Aurecon Hong Kong
Building Developer / Owner : Nan Fung Development
Project Manager : Nan Fung Development
Quantity Surveyor : Rider Levett Bucknall
Architect : Thomas Chow Architects
LEED Consultant : Arup
Lighting Designer : Lightlinks International
MVAC Contractor : Westco Chinney
Electrical Contractor : ATAL Building Services Engineering
AV / ICT Contractor : PCCW
Fire Services Contractor : ATAL Building Services Engineering
P&D Contractor : Chan Chi Kee
Main Contractor : Paul Y. Builders
Facilities Manager : Savills Property Management

PROJECT OF THE YEAR AWARD – RETROFIT BUILDING

MERIT :

RETROFITTING WORKS AT PARK CENTRAL SHOPPING ARCADE

Organisation: Hong Yip Service

康業服務有限公司
Hong Yip Service Company Ltd.

Park Central Shopping Arcade is located at Tseung Kwan O (TKO) since 2002. In order to facilitate the future expansion of TKO development, major interior renovation and retrofitting of building services installations have been carried out from 2015 to 2019.

The aims of retrofitting include :

1. to improve indoor environmental quality to our tenants and visitors;
2. to enhance the central chiller plant to meet the demand in future;
3. to implement IoT technology for improving energy control and efficiency.

Since the renovation works were split into 2 phases, which means that all retrofitting works were carried out phase by phase without any interruption to users. Some of the major retrofitting of building services installations are summarised below:

a) To improve IEQ - all facilities should be designed to comply with the standard of building energy code 2015, therefore all lightings were changed to LED light sources. In addition, according to new interior layouts, all new air-side equipments are installed with CO_2 sensor and frequency inverter.

b) To enhance the central chiller plant - the existing air-cooled chillers and pumps are partially replaced by VSD type chillers and VSD pumps. Besides, we have considered to cater the increasing of cooling capacity in future by selecting the chillers with higher capacity and also facilitate to reduce the no. of chiller to be operating in meantime.

c) To implement IoT technology - the self-developed cloud based IoT management platform is used to monitor the daily operating activities, such as IAQ, indoor temperature, water leakage, security system including CCTV, door contacts of common area and tenants' premises. The indoor IoT temperature sensors are wireless removable type, which are installed at the temperature sensitivity zone. By observing the real-time temperature status, the cooled air supply set-point could be adjusted effectively in order to improve the energy efficiency.

Energy performance enhancement is one of the key drivers for the retrofitting works, the energy consumption after the completion of retrofitting works is reduced by 19% comparing with the energy consumption in 2013-2014, which is better than 50% of the same type of building in Hong Kong.

ORGANISATION:
Hong Yip Service

PROJECT ADDRESS:
No.9, Tong Tak Street, Tseung Kwan O, N.T.

PROJECT TEAM:
Facilities Manager : Hong Yip Service

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FACILITIES MANAGEMENT TEAM AWARD

WINNER :

HONGKONG LAND CENTRAL PORTFOLIO PROPERTY MANAGEMENT TEAM

Organisation: Hongkong Land (Property Management)

Hongkong Land (HKL) Property Management team strategy and operational performance objectives are as follows :

a) Health and Safety objectives – HKL pledges to maintain the highest standards and to make significant progress on our health & wellbeing initiatives. Their commitment is to maintain a zero-fatality rate. It is believed that work-related incidents and occupational diseases are neither determined by fate nor unavoidable. The following strategy is applied in order to reach the commitment, including

1. Provide sufficient health and safety training to all staff;
2. Implement strict in-house safety rules;
3. Establish a comprehensive inspection program;
4. Develop the preparedness and response procedure in all operations for potential accidents and emergency situations; and
5. Conduct risk assessment so as to implement the appropriate risk control measures within HKL's work activities.

b) Wellbeing and productivity of occupants objectives – HKL is a supporter of the Joyful@Healthy Workplace Charter, Mental Health Friendly Supreme Organisation and Good Employer Charter in Hong Kong operation. Achieving WELL Building Standards to HKL's Headquarter office is in progress. It is believed that having a joyful and healthy workforce is a cornerstone of the long-term success of the organisation. HKL pledges to promote physical and mental wellbeing among staff with an emphasis on healthy eating, physical activity, and mental wellbeing. Also, in-app thermal comfort control for the staff and tenant to adjust their own comfort in office area had been provided. With a better working environment, the productivity of occupants can be much increased.

c) Energy efficiency and carbon emissions objectives – HKL's Central Portfolio includes 12 commercial buildings in Central, all certified with the highest rating (Platinum) of BEAM Plus Existing Building v2.0 and 30% carbon emission reduction in 2019 compared to 2008 baseline had been achieved.

Sustainability, innovation, and service excellence are our main objectives in facility management. HKL thrills to implement innovative technologies into our buildings, i.e. IoT network (LoRaWAN), digital twin chiller optimisation, in-app AI personal thermal control, automatic system fault detection, innovative on-site renewables, complete EC plug fan replacement, etc. besides, two teams has been setup to specialised in digital transformation and

innovative technologies. The two teams will explore the market to look for innovative solutions and get feedback from facility management team on our pain-points. All innovative technologies must go through Proof-of-Concept, stakeholder engagement, and refinement before a large-scale implementation.

HKL has always been supportive and collaborative with our tenants for creating a more sustainable future. Green fit-out guide have been developed, which aim to encourage tenants to join the Green Challenge, to eliminate the use of bottled water by providing provision of water filter machines, and to participate in green schemes by NGOs. Besides, video content has been created to show on the lift TV screen to provide green tips that the tenants can do to reduce environmental impact. These efforts have promoted the change in behaviour of our tenants for a more sustainable future.

HKL has initiated and developed the Smart Green Facility Operations to redefine facility operations. Our integrated operations aim to reduce reliance on manual labour and instead use artificial intelligence (machine learning), digital twins, intelligent security systems, video analytics, cloud-based control, and big data analytics to perform the necessary analysis and to provide useful insights from the operational and user data, all of which can enhance operational efficiency and allow the implementation of green operations. The Smart Green Facility Operation has helped in enhancing energy and operation efficiency. Since the launch of Smart Green Facility Operation in 2018, a significant reduction in electricity usage (6,169,200 kWh less from electricity bills) in 2020 compared to 2017 for our Central Portfolio was recorded. Most savings came from our analytical programme led to enhanced system operating efficiency by identifying the inefficient operation, optimised chiller operation by AI programme, informed decision by data on strategic enhancement of air-side and water-side equipment.

In the maintenance point of view, HKL's energy management system is jointly developed with the air-conditioning system maintenance contractor. This collaboration has enhanced the usefulness and accuracy of our energy management system. The rules and AI algorithm are developed to help our air-conditioning system maintenance contractor to easily identify the faults and energy inefficiency and provide useful insights to our maintenance contractor as they are also benefited from the system.

ORGANISATION:
Hongkong Land (Property Management)

PROJECT ADDRESS:
8/F, One Exchange Square, Central, Hong Kong

PROJECT TEAM:
Facilities Manager : Hongkong Land (Property Management)
MVAC Maintenance Contractor : Jardine Engineering Corporation
BMS Maintenance Contractor : Jardine Engineering Corporation

FACILITIES MANAGEMENT TEAM AWARD

MERIT :

SHANGHAI STREET 618 SUSTAINABLE FM APPROACH FOR OPERATION AND MAINTENANCE

Organisation: Urban Renewal Authority & AECOM Asia

618 Shanghai Street Preservation and Revitalisation Project (618 Shanghai Street Project) covers 14 street numbers, of which the oldest ten blocks are verandah-type tenement buildings built in the 1920s, one of the few remaining rows of pre-World War II buildings in the urban area. They are assessed as Grade 2 historical buildings by the Antiquities Advisory Board.

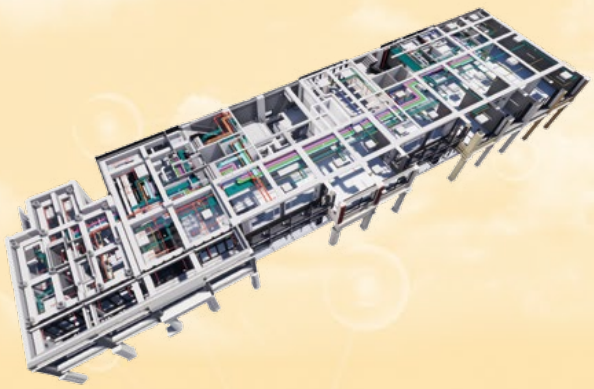
The project requires the perseveration of old shophouses cluster of historical value as well as upgrading of building services to meet modern buildings standards and transform to a publicly accessible shopping mall. In this design stage to operation stage, the project team use BIM technology to prepare the building design, coordination works and extend to facility management usage.

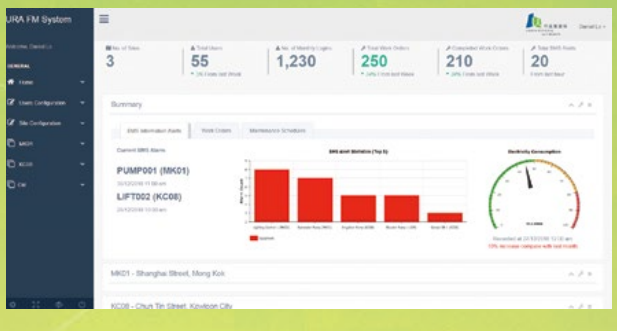
In the operation stage, this project on one hand aims to attain energy efficiency with the adoption of innovative technology, and on the other hand promote and educate the public about heritage conservation and that digital city and history complement each other. Public visitors can view the historic elements by using their mobile devices as personal user guide, to recognise the significance of heritage values for the cluster of shophouses, especially their usefulness and daily relevance of to the Community.

The vision of the Urban Renewal Authority (URA) embraces the concepts of better maintenance and management of building for sustainable development and building a quality city. Therefore, the URA begins to adopt BIM in development projects. In this project, a centralised Building Information Model – Facility Management (BIM-FM) system is established as the core technology with integration to FM database. The platform integrates the as-built Building Information Modelling (BIM), Facility Management System (FM) and the Building Management System (BMS) data from the Internet of Things (IoT) sensors installed on site, such as Long Range wireless (LoRa) door contact sensors, CCTV controllers, lift level sensors, plumbing and drainage services sensors, fan speed controllers, etc.

The FM Team aims to streamline the daily FM workflow for future URA projects; to upkeep a safe and comfortable environment for occupants and public visitors and to provide a pleasant space for business and leisure purposes; and to achieve energy efficiency with active tracking and monitoring on data collected on BMS through IoT, and hence reduce carbon emission in daily operation.

The real time collaboration for operation and maintenance is the key to success. However, technically, it is very difficult to connect the as-built BIM, BMS and FM together as a centralised platform as such integrated showcase has never





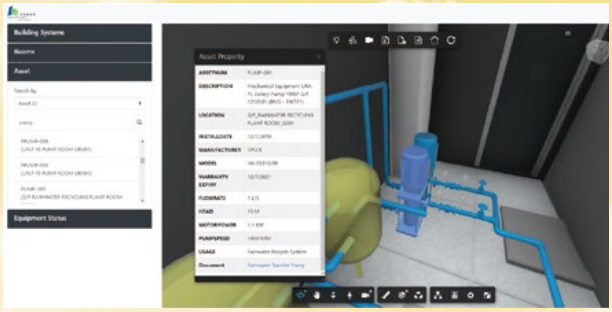
been done in Hong Kong as a reference. Hence, we need to design and ensure that the connections between BIM, BMS and FM, as well as the IoT systems are well defined, and that they are well connected in the available format to achieve FM purpose. Besides, it is also challenging for data to be communicated in real time. As the URA planned to launch such platform for all coming projects in the future, the design of the centralised BIM-FM platform must be flexible while retaining the data uniqueness from different projects.

To address the above challenges, the as-built BIM model is managed in the centralised BIM- FM platform. It is integrated with BMS as a control panel to control the site equipment such as CCTV and lighting panel. The centralised BIM-FM platform help significantly reduce operating cost and maintenance effort in a paperless and sustainable way. It also optimises building performance of the assets by analysing the savings of various facility improvements.

IoT systems installed on-site are connected to the BMS which can monitor and manage all building facilities such as CCTV, Pumping, and Lighting. By analysing the real time signals, equipment status and energy consumption collected from the BMS through a series of dashboards and graphs, a preventive maintenance programme can be identified and carried out before asset failure. Advanced alerts via email/ SMS can be sent and displayed on the dashboard of the centralised FM platform. As a whole, with all data stored on a single cloud BIM-FM system, the use of paper and the time for filling out PDF forms is greatly reduced when compared to the traditional method of asset stocktaking, asset information, maintenance history and the works order issuing practice.

Collaboration of project team members is evident throughout the entire project lifecycle with BIM adoption, from preliminary design, detailed design, construction, operation and maintenance stage. It is one of the key elements for a success project delivery between multi-disciplinary project stakeholders such as the property manager, engineer, field team and contractors during the operation and maintenance stage.

This project is a pioneer project in Hong Kong with using BIM for the entire project life cycle from design, construction, operation to maintenance. The centralised BIM-FM platform integrates BIM, FM and BMS as ONE holistic and consolidated solution. It is designed to cater for needs from management, engineers, field teams and contractors. It is worth noting that the platform is at the forefront of BIM in terms of the integration techniques used. Rather than mere providing a data exchanging mechanism between BIM and FM systems, it provides a real-time facilities information management system by manoeuvring freely through the BIM, FM and BMS information on one single integrated platform for all projects. In the future, the current centralised BIM-FM platform will be integrated to all other URA self-developed projects.



ORGANISATION:
Urban Renewal Authority & AECOM Asia

PROJECT ADDRESS:
No. 618 Shanghai Street, Mongkok, Kowloon, Hong Kong

PROJECT TEAM:
Facilities Manager : Urban Renewal Authority
Building Developer / Owner : Urban Renewal Authority
Project Manager : Urban Renewal Authority
Facilitate Management Platform Contractor : AECOM Asia

FACILITIES MANAGEMENT TEAM AWARD

MERIT :

THREE GARDEN ROAD

Organisation: Keysen Property Management Services

Three Garden Road is a modern glass and steel commercial complex located at the heart of Hong Kong's vibrant financial centre. Completed in 1992 and in recognition of excellence its architectural design, Three Garden Road was presented with the Hong Kong Institute of Architects' highest award in 1994, the Silver Medal. With gross floor area of 152,000 m², Three Garden Road complex comprises two towers - Champion Tower; a 47-storey building and ICBC Tower, a 37-storey building, plus a carpark and retail podium.

Keysen Property Management Services (Keysen) is committed to providing a sustainable healthy, wellness and efficient working environment to our tenants, visitors and staff. In order to provide a safe and healthy workplace, the in-house registered safety officer conducts regular safety trainings and provides adequate safety guidelines to all staff and service providers to ensure different kinds of work are conducted properly. Apart from carrying out timely assessment and continuous enhancement on the work facilities, effective crowd management, risk assessment and contingency plans are in place to maintain highest level of safety and security. Record of zero occupational fatality and injury rate of staff in 2019 were well maintained. Routine emergency drills are also conducted in the workplace to reinforce the safety awareness among the tenants, staff and service providers. Additionally, effective precautionary hygiene measures are implemented to maintain a healthy environment and minimise the spread of infectious diseases.

Furthermore, Keysen aims to promote wellness, of which one of the critical indicators at workplace is the indoor air quality. In order to pursue excellent indoor air quality, CO_2 sensors are installed to monitor indoor CO_2 concentration, one of the most important parameters in indoor area. The fresh air supply is continuously adjusted based on the CO_2 level to maintain satisfactory indoor air quality. Excellent Class of IAQ Certification Scheme organised by Environmental Protection Department had been achieved for over 10 years. Apart from technical aspect, various environmental and wellness campaigns and events are organised for the tenants to promote a green, healthy and wellness lifestyle.

Energy saving is one of the key objectives achieving the targets, facilities management measures had been taken to reduce energy use, including :

- Chiller plant replacement
- Demand control ventilation with Internet-of-Things (IoT) technology
- Chilled water bypass valve reset control
- Chilled water supply temperature reset
- LED tubes replacement and modification of lighting schedule

To continuously enhance the quality of our building management services and building facilities, tenant survey is conducted annually. It is a comprehensive survey covering different aspects including the service quality of the property management team, technical team as well as cleaning and security services. It also covers the satisfaction towards the building facilities and environmental protection measures carried out by the property management team. All the data collected will be statistically analysed while the valuable written feedback will also be carefully evaluated.

Great Eagle Group has established the long-term goals in alignment with nine of the United Nations' Sustainability Development Goals. 14 long-term ESG targets are set under the 2030 blueprint, making significant headway in sustainability performance by implementing a systematic and measurable approach. In the area of energy, carbon and water consumption, key performance indexes are set to be achieved in 2030. With base year 2011, energy consumption and carbon emission are targeted to be reduced by 42%. Water consumption is targeted to be reduced by 25% with base year 2014.

A new working team named "Energy Management, Environmental and Sustainable, Development Team" is established for promoting the sustainable growth of company. The Team focuses on sharing the latest sustainable information, innovative technologies and discussing the environmental managements issue among members. During monthly meetings, electricity consumption of that month will be reviewed to keep track of the key performance index in energy reduction.

ORGANISATION:
Keysen Property Management Services

PROJECT ADDRESS:
No. 3 Garden Road, Central, Hong Kong

PROJECT TEAM:
Facilities Manager : Keysen Property Management Services
Building Developer / Owner : Great Eagle Group

FACILITIES MANAGEMENT TEAM AWARD

MERIT :

V CITY

Organisation: Kai Shing Management Services

V city, strategically located atop Tuen Mun MTR Station, Light Rail Station and a major transportation hub, is Sun Hung Kai Properties' flagship shopping mall in the New Territories West. The 300,000-square-foot shopping mall features a modern lifestyle concept that appeals to both local young people and tourists.

V city aims to achieve "Smart Building, Green and Safe Shopping" by involving the elements of innovative technology, sustainability and safe environment in facility management. The team has put huge efforts on Energy Efficiency & Conservation projects like retro-fitting and retro-commissioning projects fully based on our site conditions in the past years with remarkable performance contributing to an estimated annual saving 1.17 millions kWh. Specific facilities management measures had been taken to reduce energy use, including :

- Cloud-based Big Data Energy Optimisation System for chilled water system
- Renewable energy installation
- Lighting enhancement
- PAU fan retrofitting to EC plug fan
- Update control logic
- Retro-commissioning for MVAC system

V city's energy reduction measure aims at maintaining customer comfort, by enhancing the equipment efficiency and minimizing indoor cooling load as the priority. Customer engagement survey is conducted on-site annually to assess the performance of Management Service Office, which also serves as a channel to listen to and respond to the property users' needs, so as to drive continuous improvement in our facility management performance and services quality.

To echo the vision of smart technology implementation, V city has implemented IoT technology as both monitoring and control purpose, including :

1. Temperature, humidity and CO_2 monitoring and control

   To enhance the energy efficiency of the MVAC system, as well as provide the greatest indoor thermal comfort to our customers and tenants, several wireless sensors are installed at different locations in our premise to record down the indoor temperature, humidity ratio and CO_2 concentration. The data collected is transferred to the

existing BMS system, which can optimise the fresh air intake automatically based on the real-time information as enthalpy and CO_2 concentration control.

2. Lighting level control and monitoring

   To optimise the energy saving of the lighting system, daylight sensors was installed at curtain wall areas (voids and footbridges) and under skylights (event space and beauty zone) to log the lighting level and control the dimness of the lighting system correspondingly.

3. Occupancy Monitoring in Functional Washroom

   In order to prevent rescue delay of disabled or needy, wireless sensors have been installed at accessible and family washrooms in V city. In detection of any fall-down of customers or occupancy duration over 30 minutes, the IoT system would automatically alert our staff to assist.

4. Rubbish bin sensor

   Rubbish bin level sensor has been installed for recording the real time level and transmits it to the IoT software so as to reduce manpower and maintain rubbish bin consumption. There will be an alarm for more than 80% fullness and our janitor will do the cleaning work only when needed.

In aligning to the latest HKSAR Government's environmental protection initiatives such as "Long Term Decarbonisation Strategy" and "Energy Saving Plan for Hong Kong's Built Environment 2015 – 2025+", V city has established a long-term practical energy sustainability target by conserving 40% energy by 2025. With such objectives, V city always strives to be a Smart Building with outstanding energy conservation performance. From 2014 to 2021, an overall accumulated energy saving of around 4.26 millions kWh have been attained which is equivalent to 33% energy saving achievement and 2.1 millions kg carbon reduction.

ORGANISATION:
Kai Shing Management Services

PROJECT ADDRESS:
No. 83 Tuen Mun Heung Sze Wui Road, Tuen Mun, N.T.

PROJECT TEAM:
Facilities Manager : Kai Shing Management Services
BMS Maintenance Contractor : ATAL Building Services Engineering

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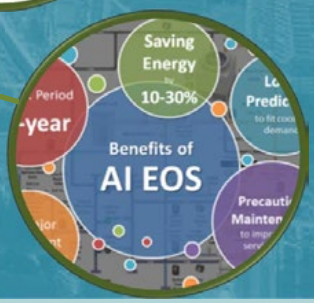

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COVID-19 ACHIEVEMENT AWARD

WINNER :

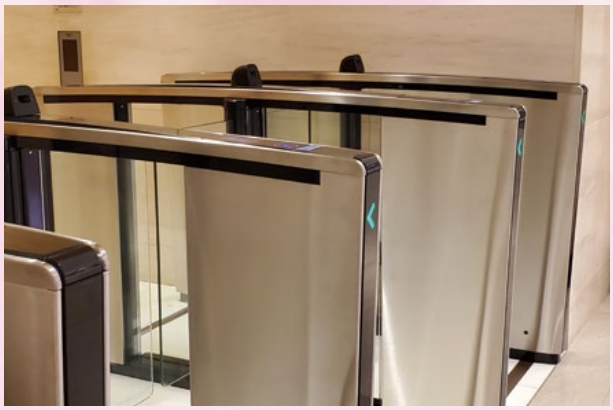
FUTURE-PROOFING THE HEALTH OF CENTRAL

Organisation: Hongkong Land (Property Management)

With the health and hygiene awareness raised in COVID-19 period, Hongkong Land believes it will continue as a trend in all future design of systems. Therefore, we have borne with the mindset for a long-term strategy rather than temporary measures from the beginning.

In building services, the core objective is to maintain an excellent indoor environment, improve businesses and working environment, provide comfort to occupants, and to enhance the living quality. The 5,000,000 sq.ft. of Grade A commercial buildings are in the heart of the Central financial hub and one of the world's busiest stock exchange is located within our buildings. Excellent indoor environment and building operation for the business of the tenants must be maintained. Starting from their foot stepped in our area, the following disinfection technologies had been deployed:

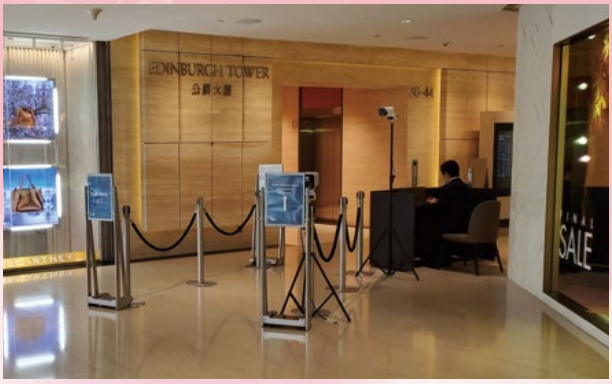
1. The first step begins with all touchable surfaces. We have applied the latest 3-layers Hybrid Photocatalyst Nano coating to all our highly touchable surfaces (e.g. lift cars, door handles, railings, etc.) in shopping malls and office common area. The nano coating has a surface hardness of 9H with warranty of 3-5 years. We have monthly testing of ATP swab test on our surface and all surfaces achieve <500 RLU (guaranteed value of vendor) up until our latest testing in April 2021.
2. Second line-of-defence is our escalator, built-in handrail UV sanitiser in all the escalators have been applied to enhance the sanitisation effort. An UV device is installed within the handrail system of our escalators, for destroying the DNA and RNA of bacteria and viruses. With the built-in UV sanitisers, the UV sanitisers are not exposed which reduces the risk of being damaged by pedestrians.
3. Before entering our office buildings, integrated thermal scanning device into our turnstile building access system have been successfully implemented which is the first of its kind in Hong Kong. This has reduced the need for manual checking and stopping of visitors with fever. We can ensure that all visitors entering our buildings are having normal body temperature.



4. According to the recommendation by ASHRAE, HVAC mitigation strategies could include Increased Ventilation, Improved Filtration, and Air Cleaning. We have adopted all 3 mitigation strategies in all our central HVAC system :
   a) Increased Ventilation: fresh air supply in all our buildings had been extended in response to COVID-19 to maximise the dilution of indoor air. At the same time, flush out in the morning by turning on fresh air supply hours before occupancy were implemented for better IAQ.

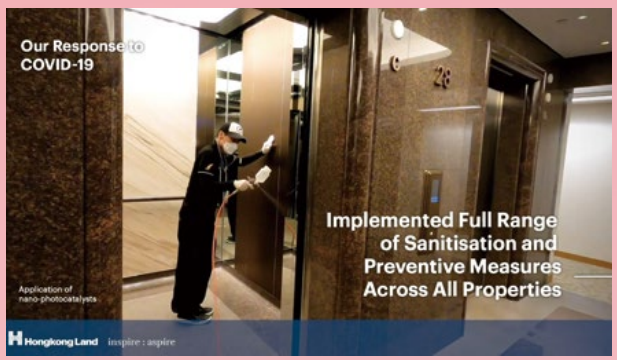
b) Improved Filtration: To enhance indoor air quality and reduce the possible spread of virus, bag filters were enhanced from industry best practice of MERV-13 to MERV-14.

c) Air Cleaning: On top of increased ventilation and improved filtration, Hongkong Land has successfully trialled active air cleaning of using UVGI in AHU. It is in the progress of installing UVGI in all our existing AHUs. By installing UVGI in AHUs, the supply air is continuously and actively disinfecting our supply air for the tenants.



Other than the preventive measures, continuous performance monitoring is considered critical. Therefore a 3-year warranty clause into the contract with regular testing of the bacteria count of the applied surface has been implemented to ensure the lasting disinfection effect of nano-coating. In accordance with the testing result, the bacteria count of the high-touch surfaces (i.e. lift buttons, door handles, railings, etc.) are maintained within the limit of the satisfactory level (<500 RLU, while Japan Standards is <1500 RLU) over a year. This has enhanced the overall hygiene of the building and prevent the spread of COVID-19 viruses.

Cleanliness has always been a subjective measure. While exploring for the testing of disinfection effectiveness of nano-coating and UV sanitiser, ATP & AMP Swab test have been applied to measure the disinfection effectiveness and used Japanese Standards to measure the acceptable cleanliness. This has set a standard for our cleanliness and we have performed regular sample swab test to our high-touched surface to ensure the cleanliness and hygiene of the buildings.



Despite the unexpected wide-spread of virus in January 2020, and the overwhelmed daily operation, maintenance and improvement works, Hongkong Land has swiftly gone above and beyond in applying all market available COVID-19 disinfection technologies and even innovated to integrate technologies to further enhanced the well-being and security and convenience. All the measures that have taken are carefully selected with Proof-of-Concept and must obtain acceptable and effective results before fully implemented. All the strategies that have been implemented are proved to be highly effective with on-going testing and measurement to ensure the last effect of the strategies. With the enormous contribution from the team, Hongkong Land has successfully prevented any potential spreading of COVID-19 viruses in the Portfolio of buildings even with confirmed cases in scattered tenants. The contribution by the Hongkong Land Property Management Team in combating COVID-19 has safe-guarded the health and well-being of the tenants and occupants.

ORGANISATION:
Hongkong Land (Property Management)

PROJECT ADDRESS:
8/F, One Exchange Square, Central, Hong Kong

PROJECT TEAM:
Facilities Manager : Hongkong Land (Property Management)
MVAC Maintenance Contractor : Jardine Engineering Corporation
BMS Maintenance Contractor : Jardine Engineering Corporation

COVID-19 ACHIEVEMENT AWARD

WINNER :
NEURON HEALTH
Organisation: Arup

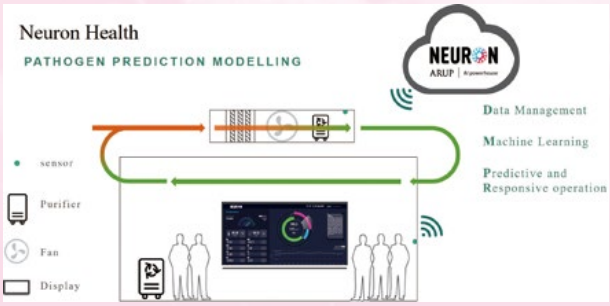
ARUP

Across the built environment, the Coronavirus pandemic is leading to an understandable focus on healthy indoor environments, particularly in social locations and workplaces. It is threatening the occupants' health through the airborne transmission within the built environment, according to the Center for Disease Control and Prevention (CDC). Building operators start looking into different preventive systems / design to protect the occupants from the threat of COVID-19. However, since there is no tool that could monitor the airborne pathogens at building level directly, we don't have a solution to tell the building operators what measures should be implemented in order to enhance the indoor condition as well as to fight against the COVID-19. Moreover, excessive / improper installation of disinfection system may worsen the air quality, hence the occupant's health. A data-driven approach should be taken to make the right decision. As organisations across the society attempt to adjust and adapt to the 'New Normal', The Neuron Health System has been invented by Arup's sustainability team to safeguard the occupants' health and wellbeing through the data-driven approach.

Neuron Health System measures various human health-related parameters, for instance indoor air quality (IAQ) aspect including particulate matters (PM), Volatile Organic Compounds (VOCs) and Carbon dioxide (CO_2), as well as dry-bulb temperature and relative humidity for thermal comfort aspect. Existence of various potential pathogens such as bacteria and viruses in the ambient air can be deduced through the correlations between those parameters and potential pathogens identified in a collaborative research with the City University of Hong Kong.

Through the collaborative research, the team has successfully identified the correlation between potential pathogens and air quality parameters. The air quality sensors measured common pollutants including, carbon dioxide (CO_2), particulate matters (PM2.5 and PM10) and total volatile organic compounds (TVOCs), as well as temperature and relative humidity. Through the correlation study, the team has used CO_2 and PM has stronger relation with the bioaerosol, therefore CO_2 and PM were used as primary proxy, while the others were used as secondary proxy for estimating the existence of pathogens in the algorithm.

Apart from the correlation study, the algorithm could also predict the air pollution and thermal comfort trend up to 30 mins with an accuracy of 90%. The algorithm reads all previous data of all air quality parameters measures by any kinds of sensors (i.e. PM2.5, PM10, CO_2 and TVOC), it can preciously predict the concentration of each parameter for coming 5-minutes, and it could forecast the range as well as the trend of each parameter for coming 30-minutes. The HVAC or purification system can then have sufficient respond time to adopt appropriate adjustment to ensure the stable and excellent air quality. In short, the algorithm analyses the



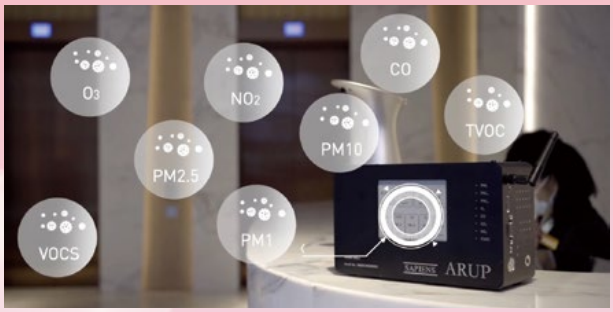
measured data, which is able to learn the schedule of HVAC system operation, occupancy schedule and activities.

The system provides a real-time IAQ performance review by offering a dashboard, and helps building operators to understand the effectiveness of existing ventilation system. Through data analytics, it allows operators to recognise the potential air quality issues. Its artificial intelligence (AI) capabilities to draws insights from historical profile and predicts pollution levels before they arise and correlate the IAQ level with pathogens concentration. Appropriate actions could then be taken and optimise the disinfection effectiveness and IAQ performance.

The system has embedded both local (e.g. HK IAQ Certification Scheme) and international standards (e.g. WELL and RESET Standard), which also be able to benchmarks the IAQ in a real-time basis and provides good reference for certification in future.

The Neuron Health System helps evaluate air quality enhancement measures in terms of their effectiveness. In one of the existing project, the Neuron Health System has deployed in a public circulation area. With the automatic control function that interlinked with the purification system, the Neuron Health System helps maintain the air quality and reduce more than 1/3 risk hours during operation. With such scientific evidence, the system helps operators and top management level to adopt the most cost-effective air quality enhancement measures through the informative decision making.

The human health-related performance should be reviewed in a real-time manner, and those data is gathered and presented in an understandable, clear & precise format. To conclude, Neuron Health System has helped building operators to enhance indoor environmental quality and fight against coronavirus by transforming data to knowledge. The system has equipped with intelligence which is able to identify concentration of pathogens and advise the effective measures for operation and design implementation. With the data- driven approach, the additional level of insight and control is not only environmentally responsible but will also lead to more resilient and sustainable built environment, ready for the challenges of tomorrow.



ORGANISATION:
Arup

PROJECT ADDRESS:
Level 5, Festival Walk, 80 Tat Chee Avenue, Kowloon Tong, Hong Kong

PROJECT TEAM:
Team Leader :
Mr. Felix CHAN, Arup

TEAM MEMBER:
Dr. Patrick LEE, City University of Hong Kong
Mr. LEE Yik Yeung, City University of Hong Kong
Mr. MIAO Yanhao, City University of Hong Kong
Dr. Tony LAM, Arup
Ms. Jill LEUNG, Arup
Ms. Scarlet LEE, Arup

COVID-19 ACHIEVEMENT AWARD

WINNER :

NORTH LANTAU HOSPITAL HONG KONG INFECTION CONTROL CENTRE

Organisation: Architectural Services Department, China State Construction Engineering (Hong Kong) China State Construction International Medical Industry Development

The 3rd wave of COVID-19 swept the city since July 2020 due to surge of confirmed COVID-19 cases, which was five times compared with the situation in May/June 2020. There was an urgent need to relieve the pressure on the demand of isolation facilities in public hospitals and to enhance society's ability on handling another wave of the epidemic. With the support from the Central Government, a temporary hospital which now named "North Lantau Hospital Hong Kong Infection Control Center (HKICC)" was commissioned within 4 months. Innovative thinking and adoption of technology were the ways to overcome the constraints and allow the design and construction running in parallel. Large scale adoption of Modular Integrated Construction (MiC) and MultiTrade integrated Mechanical, Electrical and Plumbing (MiMEP) by assistance of full Building Information Modelling (BIM), Virtual Reality (VR) and Augmented Reality (AR) technology, advanced and tightened site asset management and positioning system etc. are key success factors in delivering the project to combat the COVID-19 threat. HKICC was built on a land reserved for future development of the AsiaWorld Expo (AWE), with total site area about 29,000m² and construction floor area about 43,000m². The design planning of building orientation has particularly considered the air intake and exhaust direction to the surrounding, noise from the North-West side railway track and the northern airport runway.

The HKICC was designed with modular hospital concept, it comprised of six 2-storey of Ward Blocks, one 2-storey of Medical Block, an Energy Centre, a VIE Tank, DG Stores, and one single storey of plant rooms for Medical Gas. It equipped with around 800 isolation beds to alleviate the rising pressure on isolation facilities. The layout of the Ward Block attached high attendance on both buildability and practicality to meet MiC construction and hospital operation respectively. The negative pressure isolation wards were strategically designed to locate along the two sides of ward block to enable maximum view and daylight penetration where nurses could monitor all wards from the nurse stations. Besides, the functional areas and plant rooms were located in the middle for effective distribution of services. Moreover, clear and aesthetic wayfinding signage were displayed inside and outside the wards.

The building services provision for the six-bed negative pressure isolation room was designed in accordance with the international standards. Each room integrated by 3 MiC modules with building services installations and associated interiors elements pre-fabricated in the factory in order to enhance the construction efficiency. Isolation cubicle adopted the stringent international infection control and user's operational requirements. Anteroom was provided for each isolation cubicle to serve as a buffer zone between the cubicle and the corridor. Uni-directional air flow by maintaining pressure differences were designed according to the international standard and guideline. To enhance system resilience and reliability, 'N+2' plug fans arrangement was designed for Primary Air Unit (PAU) for isolation ward cubicle. Each PAU served limited isolation cubicles such that large extent of service interruption due to maintenance or equipment failure could be minimised. Besides, the operation sequence of supply

air fans in PAU and exhaust air fans for isolation bed cubicle was carefully designed such that interlocking control of fans and the led operation of exhaust air fan were designed with a view to ensure the right pressure relationship between the cubicle, anteroom and the corridor. Moreover, differential pressure sensors were provided for real-time monitoring of the pressure relationship by the hospital. For Medical Block, it consists of laboratories, pharmacy, storerooms and supporting facilities for medical staff. The laboratory is designed in accordance with BSL-2 standard and equipped with Nucleic Acid Extraction and Automatic Analyzers by the user for the conduction of COVID-19 tests.

For such a fast and demanding project, developing a successful early coordination through collaborative efforts among various stakeholders (contractor, government bodies, statutory authorities, client, supplier, etc.) was the cornerstone to complete this project. In addition, ArchSD had made early coordination among the user Hospital Authority and maintenance agent EMSD to set criteria for handover of works in one-go through early getting involvement of them from design to commissioning stages.

This task might be unprecedented in local industry but challenges were not underestimated. Innovative thinking and adoption of technology were the ways to overcome the constraints and allow the design and construction running in parallel. Large scale adoption of Modular Integrated Construction (MiC) and MultiTrade integrated Mechanical, Electrical and Plumbing (MiMEP) by assistance of full Building Information Modelling (BIM), Virtual Reality (VR) and Augmented Reality (AR) technology, advanced and tightened site asset management and positioning system etc. were key success factors in delivering this unprecedented project. All these construction technologies not only benefit to the compressing the construction programme but also help to facilitate the quality control of workmanship, to reduce overall construction waste and to allow a relatively safe and comfort off-site working environment for workers.

The project from conceive, design and construction took only four months to build in compliance to the statutory requirement with stringent infectious control requirements compliance. By adopting smart construction system and the excellent construction management such as MiC, MiMEP, BIM, VR and AR, the project was able to be delivered within 4 months. From technical point of view, the interfacing of various building services systems with the MiC module is the most difficult part to overcome where air tightness inside isolation room for effective pressure control is the core design objective. It is certainly a miracle and record breaking mission.

The building services professionals played a crucial role in the whole process of design, installation and T&C of the building services installation which contributes high portion of construction work of a hospital to ensure the system reliability, effectiveness of infection control and public health and hygiene. The works are not only secure the medical professions who are working against contaminants and no spread to other hospital attendants nor visitors, but also ensure environmental safety from viral and bacterial infection.

ORGANISATION:
Architectural Services Department, China State Construction Engineering (Hong Kong) and China State Construction International Medical Industry Development

PROJECT ADDRESS:
Sky City Road, Airport Island, Lantau, Hong Kong

PROJECT TEAM:
Building Services Engineer : China State Construction Int'l Medical Industry Development
Building Developer / Owner : Architectural Services Department
Project Manager : China State Construction Engineering (Hong Kong)
Architect : China State Construction Int'l Medical Industry Development
Lighting Designer : China State Construction Int'l Medical Industry Development
MVAC/Electrical/BMS/ELV/ICT/Fire Services/P&D Contractor : China State Mechanical & Electrical Engineering
Main Contractor : China State Construction Engineering (Hong Kong)

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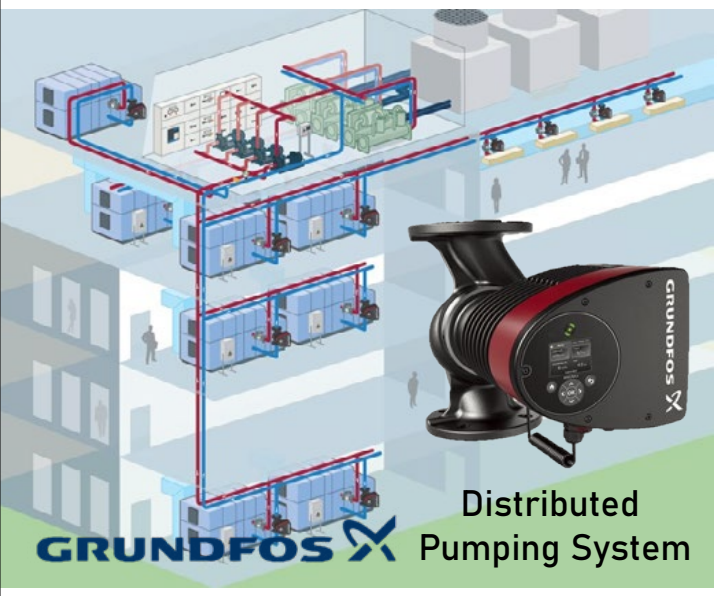

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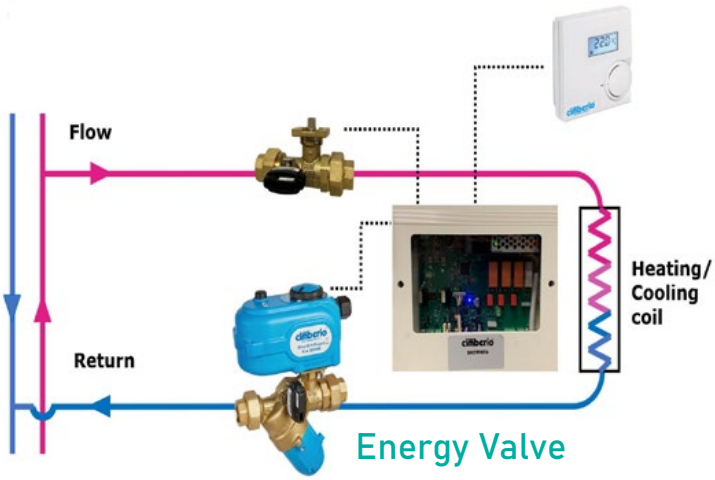

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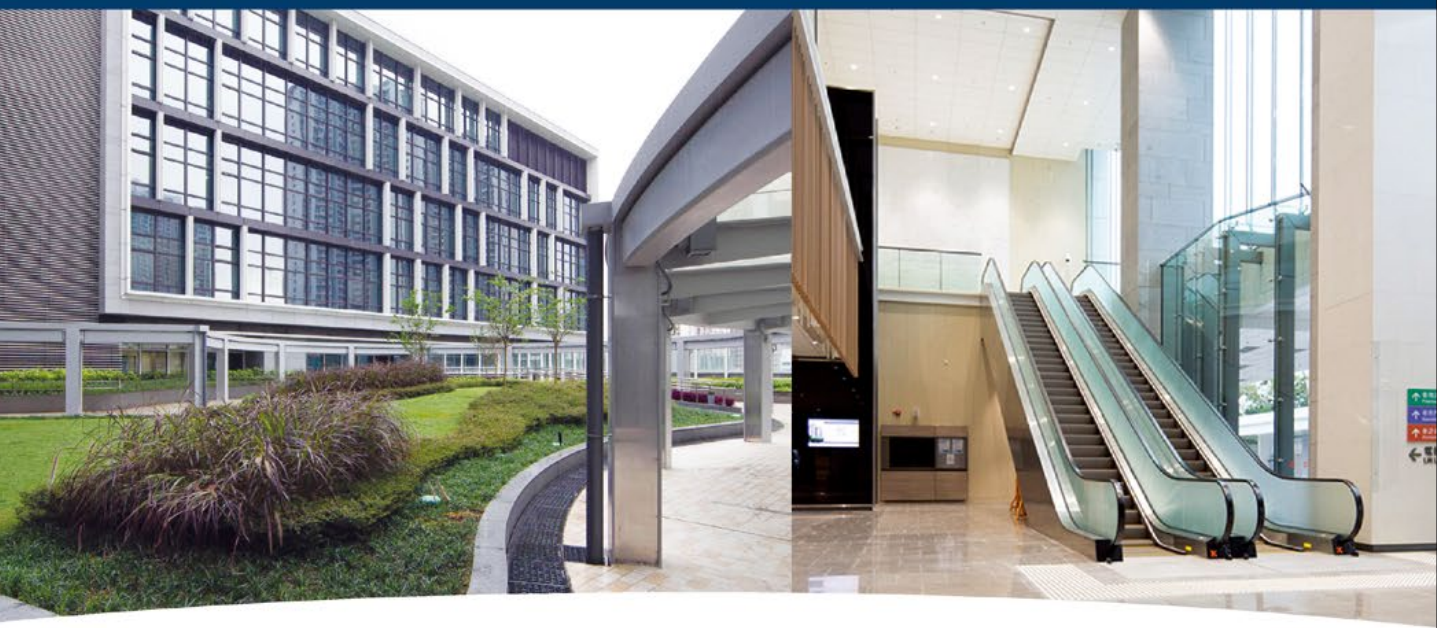

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