

INNOVATING BEYOND THE MOMENT

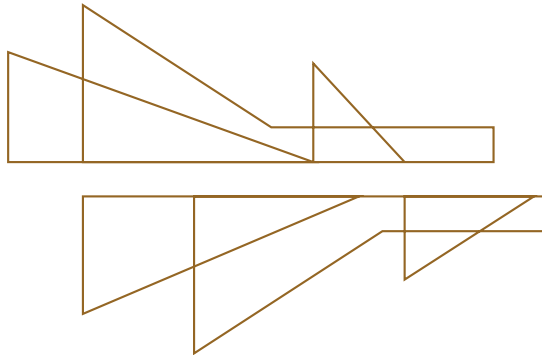
ADOPTING SUSTAINABLE AND GREEN BUILDING DESIGN

GRI102-44

SUPPORTING THE UNSDGS



We adopt active and passive sustainable building designs, to enhance energy efficiency and thermal comfort



Buildings account for about 90% of Hong Kong's total electricity usage, attributing to over 60% of carbon emissions of the city. To reduce their environmental impact, we actively adopt innovative, sustainable and smart designs, and promote the effective use of energy, materials and land.

PASSIVE DESIGN APPROACHES

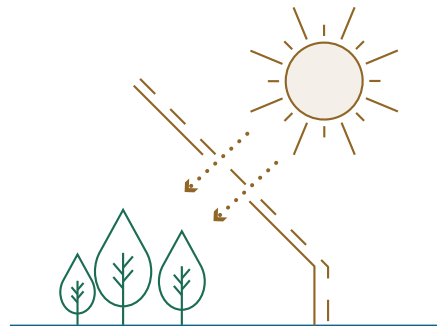
Passive design harness building architecture to provide energy-saving benefits and enhance thermal comfort. With appropriate planning, disposition, orientation, building form and

material selection, the interaction between buildings and the local microclimate is optimised.

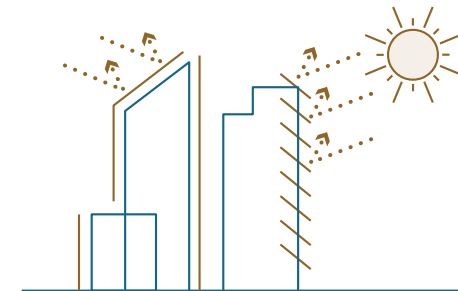
Aspects to be considered include:



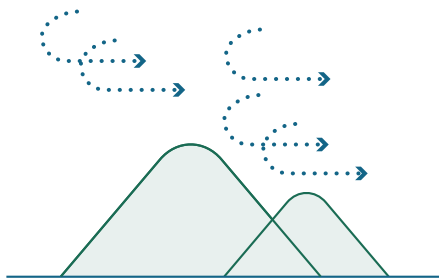
Mitigating heat island effect or elevated temperature



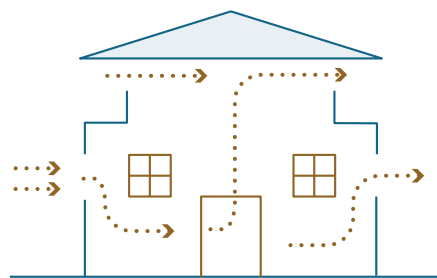
Daylighting



Reducing heat gain through building envelopes



Natural ventilation



Passive Cooling



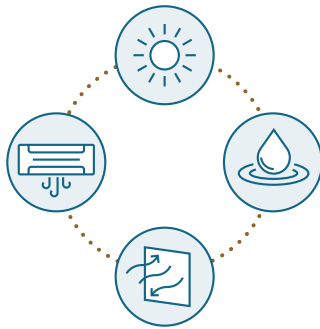
Air ventilation around buildings

ACTIVE SUSTAINABLE BUILDING DESIGN APPROACHES

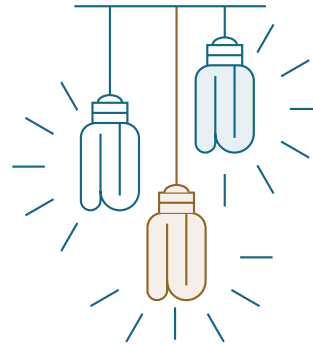
Active design approach utilises electrical and mechanical systems to create comfortable and sustainable conditions. Such systems contribute to improving

energy efficiency, water conservation and indoor air quality.

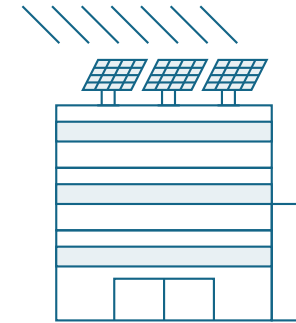
Aspects to be considered include:



Heating, ventilation and air conditioning (HVAC) systems and water-efficient devices



Lighting systems



Renewable energy technologies

SELECTION OF SUSTAINABLE CONSTRUCTION MATERIALS

The selection and prioritisation of sustainable construction methods and materials are also key aspects of sustainable buildings. During construction, prefabrication and pollution

control are commonly practised. Additionally, the 3R principles – reduce, reuse and recycle – are widely adopted to effectively manage construction and demolition waste. When

sourcing materials for new building projects, ArchSD is committed to using sustainable materials such as recycled materials and timber from well-managed sources.

PROJECTS WITH SUSTAINABLE FEATURES

CASE STUDY

TRANSPORT DEPARTMENT'S VEHICLE EXAMINATION COMPLEX



Transport Department's Vehicle Examination Centre (VEC)
at Sai Tso Wan Road, Tsing Yi

II' A SHOWCASE ON SUSTAINABLE BUILDING DESIGN 'II



—
PROJECT TEAM

THE NEW VEC IS CONCEIVED AS A SUSTAINABLE DESIGN EXEMPLAR FOR GOVERNMENT BUILDINGS. WE STRIVE TO ACHIEVE VARIOUS NATIONAL AND INTERNATIONAL SUSTAINABILITY BENCHMARKS IN THIS SIGNATURE PROJECT.

ArchSD endeavored to achieve Gold rating under BEAM Plus and adopted both passive and active sustainable designs in this project. Façade fins were installed for an optimal shading performance in winter and summer. Large openings design allows the capture of natural cross ventilation inside the building. We also took a step further to utilise high-performance glazing to optimise the overall thermal transmittance value, energy efficiency, occupant thermal comfort and natural daylight penetration.

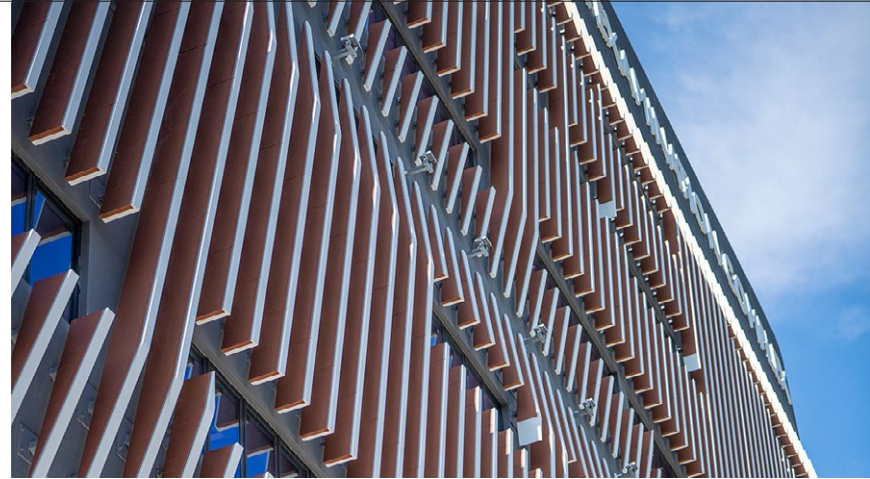
A wide range of active designs was incorporated to promote both performance and sustainability. Mechanical fans with sensors were in place to minimise pollutant level. Lighting systems were designed to optimise energy conservation. Aiming to advocate renewable energy adoption, solar panels were installed as a clean source of energy supply.

In addition to sustainable design, we also initiated the leveraging of innovative technologies since the initial planning of the project to further boost up its energy efficiency and sustainable performance. 3D Scanning was used to obtain an accurate measurement of the surrounding features. BIM models and computerised simulations were adopted for better design and quality control.

CASE STUDY
—
TRANSPORT DEPARTMENT'S VEHICLE EXAMINATION COMPLEX



Green roof for heat transfer reduction



Façade fin is specifically tilted by 15 degrees for optimum shading performance



Lawn areas with rich green landscape



Modular cooling tower and condensing water pipework system

CASE STUDY
—
TRANSPORT DEPARTMENT'S VEHICLE EXAMINATION COMPLEX



Solar panels on rooftop

PROJECTS WITH SUSTAINABLE FEATURES

CASE STUDY

CONVERSION OF THE FORMER FRENCH MISSION BUILDING FOR ACCOMMODATION USE BY LAW-RELATED ORGANISATIONS AND RELATED PURPOSES



Overview of the building

CONVERSION OF THE FORMER FRENCH MISSION BUILDING FOR ACCOMMODATION USE BY
LAW-RELATED ORGANISATIONS AND RELATED PURPOSES

II' ADOPT GREEN FEATURES WITHOUT COMPROMISING ITS HERITAGE VALUE 'II

THE PROJECT CONVERTS THE FORMER FRENCH MISSION BUILDING FOR ACCOMMODATION USE BY LAW-RELATED ORGANISATIONS AND RELATED PURPOSES TO MEET THE MODERN FUNCTIONAL DEMANDS AND GREEN BUILDING CRITERIA WHILE RETAINING ITS HISTORICAL VALUE.

The former French Mission Building (FMB) is a four-storey building with an internal courtyard at a site of about 1,360 m² at Battery Path. The FMB was not only restored to its architectural style when first completed in 1919 as far as practicable based on available historical records but also given a new life to serve for accommodation use by law-related organisations and related purposes. The key objective of Green Adaptive Reuse is a powerful alternative to building demolition and has delivered great economical, social and environmental benefits to the society while preserving important heritage values that define our culture over time.

The original building structures, materials and finishes such as timber floor, external timber shutter, etc. were mostly retained to restore the valuable character of the building and reduce the construction wastes. Old timber cabinets installed during its use as former Court of Final Appeal were skillfully transformed into new wardrobes for giving out to underprivileged groups. Despite the various constraints of renovation works, the project has achieved Provisional Gold rating under BEAM Plus.

CASE STUDY

CONVERSION OF THE FORMER FRENCH MISSION BUILDING FOR ACCOMMODATION USE BY
LAW-RELATED ORGANISATIONS AND RELATED PURPOSES



Restored external timber shutters which serve as effective sun shading device since 1919



Restored internal courtyard meeting current statutory standards for adaptive reuse



Restored timber floor to retain building character and reduce construction wastes



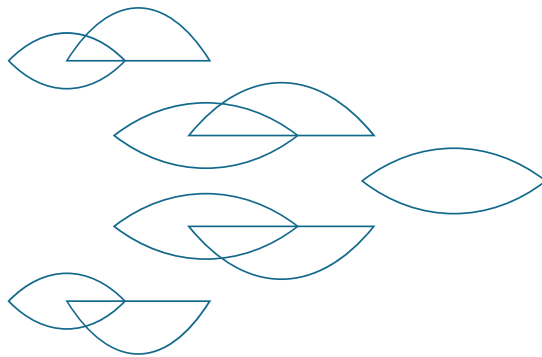
Transformed the old timber cabinets into new wardrobes and installed at underprivileged groups

EMBRACING INNOVATIVE CONSTRUCTION AND TECHNOLOGY

SUPPORTING THE UNSDGS



We promote innovative construction methods such as MiC and Multi-trade integrated Mechanical, Electrical and Plumbing (MiMEP) to streamline our construction process and advocate the technologies in the construction sector



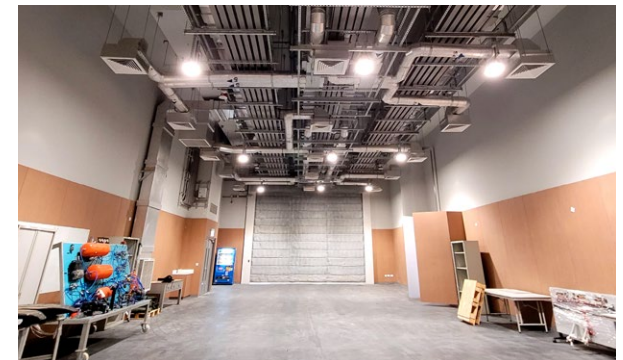
Innovation is the key to the success of the construction industry. As an exemplary leader in the industry, we are dedicated to promoting the latest ideas and technologies to the industry peers. In the long run, innovation drives productivity and sustainable development and helps us address the challenges in the industry.

ArchSD has been devoting to exploiting and promoting the adoption of MiC and MiMEP in the construction industry of Hong Kong. MiC refers to a construction method whereby free-standing volumetric modules (with finishes, fixtures, fittings, etc.) are manufactured off-site and then transported for constructing buildings. MiMEP is considered as a continuity of recent success of MiC for the local construction industry, which refers to the integration of multi-trade building services components into a single assembly of prefabricated modules, manufactured in a factory then transported to the site for connection of modules to complete various trades of building services installations on site. The MiMEP construction method has the benefit of reducing on-site labour demand and not being affected by site constraints.

With the adoption of these two innovative construction methods, it can not only contribute to enhancing the quality of construction and mitigating environmental impacts like carbon emissions and waste generation, but also benefit in helping relieve the challenges that local industry is facing with, including demand of workforce, aging of skilled labour, stringent site safety and quality requirement, and high demand of construction productivity especially in challenging time.



Integrated Air Handling Unit



Ceiling mounted multi-trade horizontal services module



Modular cooling tower & condensing water pipework system



Modular cooling tower & condensing water pipework system

PROJECTS WITH INNOVATIVE FEATURES

CASE STUDY

FIRE SERVICES DEPARTMENT PAK SHING KOK MARRIED QUARTERS



General view of Fire Services Department
Pak Shing Kok Married Quarters



II' THE FIRST HIGH-RISE CONCRETE MiC BUILDING IN HONG KONG 'II



—
TECHNICAL EXPERIENCE SHARING FOR
ADOPTION OF MiC TECHNOLOGY

STANDARDISATION, SIMPLIFICATION AND SINGLE INTEGRATED ELEMENTS ADOPTION IN THE DESIGN AND CONSTRUCTION OF THIS PROJECT WHILE MINIMISING THE IMPACT TO THE ENVIRONMENT AND COMMUNITY.

The project comprises of four 16-storey blocks and one 17-storey block. There are also ancillary facilities and a central landscaped area for supporting functions and leisure purposes.

The typical floor of each block was constructed using 46 concrete modules to form 8 dwelling units, with size of about 50 m² each. In total, the project provides 648 dwelling units, comprising 3,726 modules that are prefabricated off-site.

The mass production of MiC modules with standardised layout allows easier construction, enhancing economic efficiency. By adopting MiC, the construction works is completed earlier than the target completion date by overlapping the on-site works and off-site fabrication works. Waste, carbon emission, noise and water pollution from site were also significantly minimised e.g. amount of landfill was reduced by over 50%; on-site water and electricity consumption was around 70% lower than in conventional construction practices, etc.

With the successful application of MiC in this pilot project, it is expected that the innovative construction method will continue to improve construction productivity, expedite work progress, enhance site safety and ensure the quality of works for our sustainable built environment.

CASE STUDY
—
FIRE SERVICES DEPARTMENT PAK SHING KOK MARRIED QUARTERS



Aerial view of the project



Adoption of BIM and MiC for design and construction

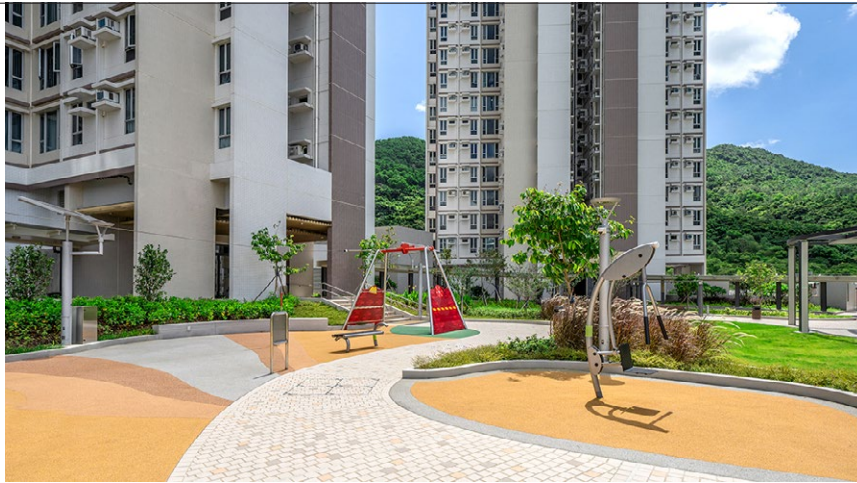


On-site assembly of prefabricated elements



Green path with shelter connects buildings

CASE STUDY
—
FIRE SERVICES DEPARTMENT PAK SHING KOK MARRIED QUARTERS



Fitness facilities in the central area



Sitting out area with shelter

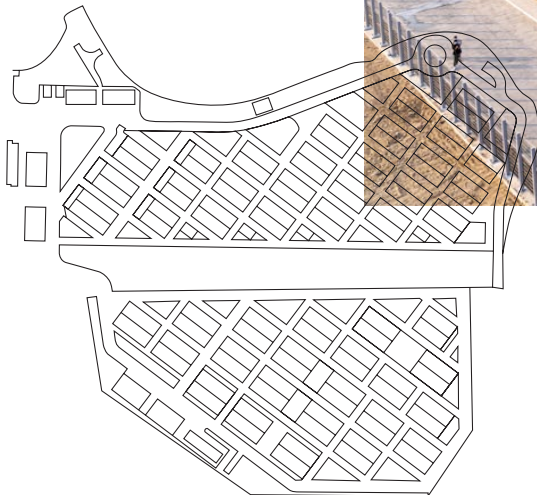


Central garden feature with extensive landscaping

PROJECTS WITH INNOVATIVE FEATURES

CASE STUDY

TEMPORARY QUARANTINE CENTRE AT PENNY'S BAY



Temporary Quarantine Centre at
Penny's Bay, Lantau Island

II' CONSTRUCTION OF THIS MAGNITUDE IN SUCH A SPEED WAS FIRST OF ITS KIND 'II

WE WORKED CLOSELY WITH VARIOUS BUREAUX, DEPARTMENTS AND CONTRACTORS TO PROVIDE OVER 3,000 NUMBER OF NEW QUARANTINE UNITS IN PHASES AT PENNY'S BAY WITHIN A 10-MONTH PERIOD.

The COVID-19 outbreak spread rapidly in the world in 2020. The compulsory quarantine demands far outnumbered the available quarantine facilities at the time. There was an urgent need to increase quarantine facilities to avoid widespread of virus in the local community. To tackle this, we have applied an innovative construction method, MiC, which contributing to the fast-track completion of the project.

The quarantine units are standardised for off-site fabrication. Fully furnished volumetric MiC units, prefabricated stairs, corridors, mechanical, electrical and plumbing modules were delivered directly to the site from factories and were ready to use after simple installation. This method enhanced efficiency, shortened the construction period and improved site safety and building quality. With innovating and caring in mind, we also utilised easy-to-clean materials and enhanced drainage design to lower the risk of possible spread of viruses and germs.

Construction of this magnitude at such a speed is first of its kind. The project has turned risks into opportunities and we have witnessed the passion for innovation through joining hands with the whole construction industry.

CASE STUDY
—
TEMPORARY QUARANTINE CENTRE AT PENNY'S BAY



Temporary Quarantine Centre at Penny's Bay, Lantau Island



Temporary Quarantine Centre at Penny's Bay, Lantau Island



Quarantine units standardised and adopted MiC for off-site fabrication



On-site installation of MiC units

CASE STUDY
—
TEMPORARY QUARANTINE CENTRE AT PENNY'S BAY



Collaboration with various phases of project contractors for construction coordination

PROJECTS WITH INNOVATIVE FEATURES

CASE STUDY

NORTH LANTAU HOSPITAL HONG KONG INFECTION CONTROL CENTRE (HKICC)



Design and Construction of North Lantau HKICC

II' HOW INNOVATIVE TECHNOLOGIES TRANSFORM THE CONSTRUCTION OF A HOSPITAL 'II

BY ADOPTING MiC AND MiMEP CONSTRUCTION METHOD, THE HKICC EQUIPPED WITH OVER 800 ISOLATION BEDS WAS BUILT WITHIN 4 MONTHS.

Innovative construction methodologies, MiC and MiMEP by assistance of full-scale BIM, were adopted extensively in this project which significantly raised quality of site coordination, simplified and speeded up the installation as well as improved the construction accuracy. Standardised isolation wards were built with each cubicle composing of 3 MiC units which were prefabricated offsite in factories and then transported to the site for installation. This resulted in a greatly compressed construction period and minimised adverse environmental impacts.

Meanwhile, VR and AR technologies were also deployed to help coordinate the details of the MiC wards for accurate mass production, position and rapid installation. A smart-site management system was also in place to facilitate project supervision, thereby saving time and manpower resources.

Innovation is the key to complete this project in solely 4-month period and in spite of that, the project managed to fully fulfil the stringent infection control requirements with robust building services installations without compromising in terms of its scale and quality against other local public hospitals.

We are honoured to achieve the Certificate of Gold Award by the Hong Kong Institute of Building Information in 2020 as recognition of our active and successful use of BIM technology in the project cycle.

CASE STUDY
—
NORTH LANTAU HOSPITAL HONG KONG INFECTION CONTROL CENTRE (HKICC)



Aerial view of the project buildings



Smart Site Management from Site Office



Dashboards of displaying BIM model for MiC / MiMEP and Smart Site Management System at Site Office



AR Technology for BIM Model

CASE STUDY
—
NORTH LANTAU HOSPITAL HONG KONG INFECTION CONTROL CENTRE (HKICC)

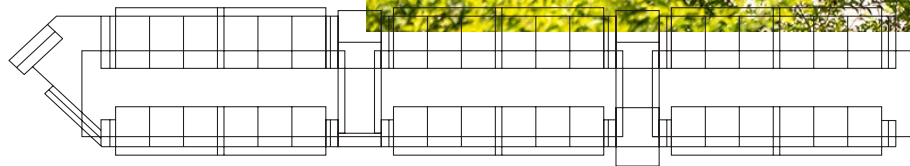


Installation of standardised unit

PROJECTS WITH INNOVATIVE FEATURES

CASE STUDY

FEHD SKYLIGHT MARKET



A convenient shopping facility with fresh foods for
local community residents

THE FIRST NEW TEMPORARY PUBLIC MARKET DEVELOPED IN RECENT DECADES

SITUATED IN TIN SHUI WAI, THE FEHD SKYLIGHT MARKET TOOK ABOUT A YEAR FROM PLANNING, CONSTRUCTION TO COMMISSIONING, PROVIDING RESIDENTS A CONVENIENT SHOPPING ENVIRONMENT.

The project aims to provide a temporary market as a transitional arrangement to meet the local demand for additional choices of fresh food provisions. It comprises 40 market stalls with a single storey container structure including 4 reserved places of pop-up stalls and ancillary services facilities with a loading and unloading bay.

By adopting MiC, the container stalls and prefabricated components were assembled on-site, allowing speedy completion within a year. Modules of the main roof shelters and the feature gutters were manufactured off-site and transported to the site for assembly using the DfMA method, achieving better workmanship and less waste in the construction site.

Meanwhile, we deployed new innovative technologies including smart micro-environment sensors to facilitate environmental monitoring. We also adopted smart materials including anti-bacteria & self-cleaning enamel panel and anti-bacteria & anti-dust coating for louvers in ventilation areas to provide residents with a pleasant and healthy shopping environment.

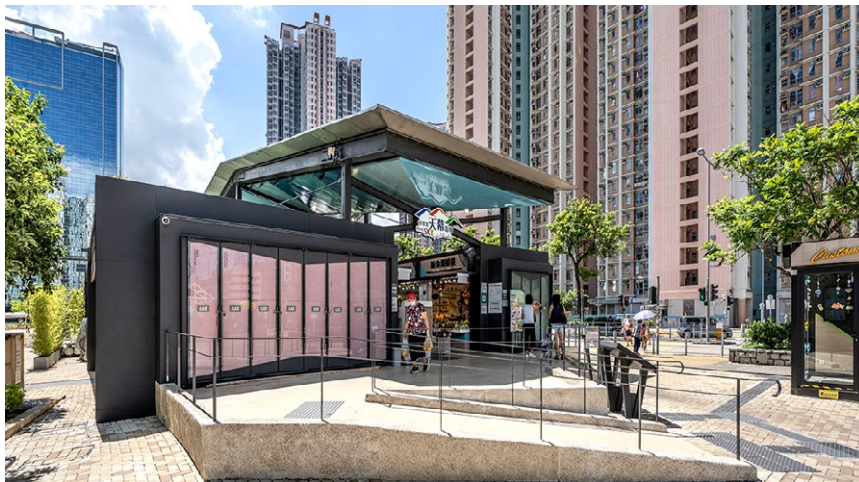
CASE STUDY
—
FEHD SKYLIGHT MARKET



Aerial view of FEHD Skylight Market



Modules of the MiC containers for market stalls were manufactured off-site and transported to site for assembly



Accessible entrance of the market



Micro-environment sensors for environmental monitoring

CASE STUDY
—
FEHD SKYLIGHT MARKET



40 market stalls (including 36 fixed stalls and 4 temporary stalls) are provided in the market



Anti-bacterial and self-cleaning enamel panel

INTERVIEW WITH CONTRACTOR



MR. DANNY C.S. HUNG

Executive Director & President, China State Construction Engineering (Hong Kong) Limited

Over the past few years, we have built a strong relationship with ArchSD through the delivery of various signature projects including the Temporary Quarantine Centre at Penny's Bay (Phases 1 and 3B), the North Lantau Hospital Hong Kong Infection Control Centre and the Hong Kong Children's Hospital. These projects are continued representations of ArchSD's long-standing commitment to sustainable and innovative construction.

ArchSD's proactive approach is particularly evident with the application of MiC. With the backing of ArchSD, we were able to smoothly and swiftly complete the construction of the quarantine centre to combat the fast-growing

spread of COVID-19 and meet the urgent anti-pandemic needs. Taking advantage of simultaneous fabrication of modular units in factories and on-site construction, the adoption of MiC shortened the project period significantly, as well as delivering a higher building quality and reduction of construction waste. ArchSD has also inspired us to adopt other sustainable construction approaches. The Penny's Bay project encompasses multiple sustainable features including the use of eco-friendly building materials that improve air quality, and sustainable life cycle planning of the quarantine units which can be demounted and repurposed after use. With ArchSD's support of these features, we are able to push new frontiers in Hong Kong's construction industry.

Throughout the course of different projects, ArchSD often shares its experiences and latest insights with us, in order to engage us in building a better construction industry together. ArchSD has also launched incentive schemes to recognise contractors' contributions to innovative and sustainable construction. We are honoured to obtain this year's Green Contractor Award – Special Award (Fast Track Project).

Our journey with ArchSD has always been a fruitful partnership. We look forward to future collaborations with ArchSD to continue the exploration and implementation of innovative construction methodologies and technologies that drives sustainability in the industry.

OUR RESPONSE

We are grateful for our contractors and project teams' efforts in pursuit of sustainability in all projects. As we advance on our sustainable journey, we remain committed to promoting sustainable and innovative construction methods and technologies and to strengthening our partnership with contractors to realise our sustainability vision together.

INTERVIEW WITH USER



MS. ALMAZ LEUNG

–
Assistant Director
(Market Special Duties), FEHD

FEHD Skylight Market, which is a temporary market commissioned in December 2020 in Tin Shui Wai, was built through the close and collaborative partnership between FEHD and ArchSD. With the aim to offer an additional choice to the public in purchasing fresh food early, we endeavoured to shorten the overall project lead time of FEHD Skylight Market as much as practicable. Thanks to ArchSD for its continuous support and professional advice on sustainable and innovative solutions throughout the planning, design, construction and commissioning phases – the project was successfully completed in about one year despite amidst the pandemic.

ArchSD demonstrated a high standard of professionalism and dedication at different

stages of the project. During the planning stage, ArchSD displayed foresight and liaised closely with various works departments and relevant organisations in an efficient manner with a view to sorting out possible technical issues and exploring effective solutions together. This was crucial to getting the project ready for proceeding to the construction stage within a short period of time. Apart from the liaison work from a technical perspective, ArchSD also provided full support and joined FEHD in the consultation with stakeholders on the project, including meeting with stakeholders and consultation with Yuen Long District Council, etc. With a good understanding of the positioning of public markets as one of the major sources of purchasing fresh provisions for the general public, which should be kept decent, clean, neat and tidy without being unduly upmarket, ArchSD placed market functionality, operational efficiency and user satisfaction high on the design agenda while adopting the concept of “place making” with the intention to create it as a place for leisure and gathering, enabling the market to serve a greater social function. To address concerns about public hygiene especially during the pandemic, ArchSD also introduced innovative features such as anti-fouling and antibacterial ceramic panels between market stalls, and nano-coating in ventilation areas to reduce dust accumulation.

With a view to commissioning the market as soon as possible, ArchSD proposed an up-stand

foundation design to minimise excavation, which facilitated construction and reduced the construction time. We also appreciate ArchSD taking the initiative to embrace innovative construction methods including MiC and DfMA to overcome the challenges of a tight construction schedule.

We look forward to ongoing and close collaboration with ArchSD in other public facilities projects. We will continue to join hands with ArchSD to promote sustainability and provide quality facilities and services for the public.

OUR RESPONSE

It has been our great honour to collaborate with FEHD to design and construct FEHD Skylight Market successfully and efficiently during this challenging time. Its great success was also attributed to FEHD’s devotion to providing the public with quality facilities. We are grateful for all the feedback from FEHD during the implementation of this project leading to the successful completion of the project. Looking ahead, we will continue to liaise with FEHD to leverage latest design and technologies in the pursuit of sustainable development in public facilities.

PROMOTING A SUSTAINABLE WORKING ENVIRONMENT

GRI 102-44

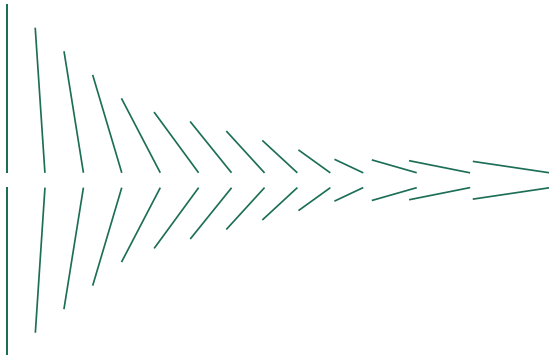
SUPPORTING THE UNSDGS



We have established a robust IMS encompasses aspects of environmental protection, occupational health and safety, and quality management to benchmark our environmental performance and ensure it remains at international standards

We conduct regular audits to verify the carbon footprint of our offices. And we explore technological advances and good practice to optimise resource consumption

We develop and circulate green housekeeping guidelines and raise awareness of green office practices



We priorities sustainability and, to that end, strive to align our operations with international standards for environmental protection, energy conservation, and health and safety. We also support international initiatives and promote sustainability in our offices, aiming to create a green working space.

The UNSDGs drive the continuous development of our sustainable working environment.

PROMOTING A GREEN WORKING CULTURE

Amid climate and environmental change, we strive to leverage our expertise to create architecture that is sustainable and climate-resilient. As a leader in the construction sector, we shoulder the responsibility of a government department to create green workplace. To this end, we have formulated a departmental Quality, Environmental, Health and Safety Policy with commitments on pollution prevent and energy and resources conservation. We are also committed to

fostering employee environmental awareness through programmes and daily engagement to optimise our sustainability efforts.

In addition to the policy, our IMS lays a solid foundation for overall environmental and energy management (ISO 14001 and ISO 50001), occupational health and safety (ISO 45001) and quality management (ISO 9001). It enables us to use international standards to benchmark our performance. Guidelines, procedures and strategies based on this

system are used to monitor and improve our performance in energy, waste, water use and indoor air quality.

Through the joint efforts of management and staff, ArchSD is once again awarded the Hong Kong Green Organisation Certificate (HKGOC). Consecutive recognition of the Environmental Campaign Committee serves as a testament to our continuous efforts and a driving force to our conscientious contribution to environmental protection in our workplace in the future.

MANAGING OUR ENERGY USE AND CARBON EMISSIONS



U'Class of Excellence'
Energywi\$e Certificate

Climate change demands that we take action and contribute to the government's long-term plan on achieving carbon neutrality in 2050. Acknowledging energy consumption, principally electricity consumption, is the primary source of our carbon footprint, we manage our consumption practices across our operating premises to ensure efficient energy utilisation. We continue to monitor our electricity use and explore different energy efficiency measures, such as lighting retrofitting works at our offices, to minimise the related greenhouse gas (GHG) emissions.

ArchSD is pleased to have maintained HKGOC's 'Excellent Level' Energywi\$e certificate in the reporting year. We are deeply honoured that our energy saving efforts have been widely recognised by the industry and the public.

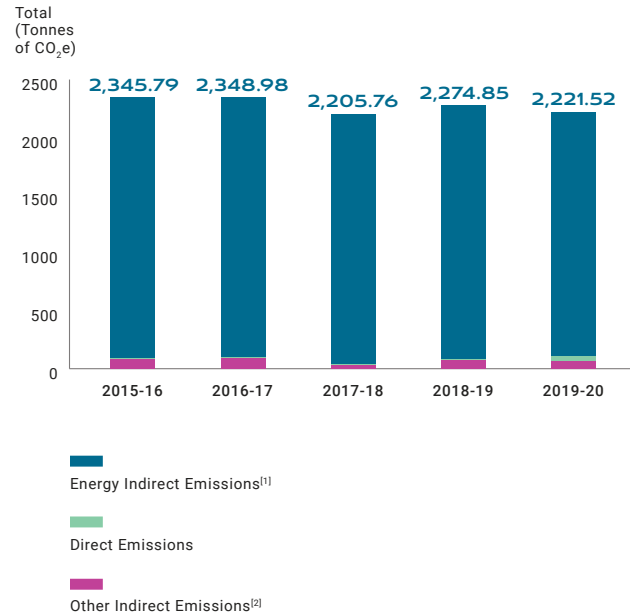
ArchSD formulates proactive measures to incorporate the elements set out in the Hong Kong's Climate Action Plan 2050 published by Environment Bureau, including a set of city-wide carbon emission reduction targets and actionable items.

To understand our direct and indirect GHG emissions and move towards the common goal, we conduct regular audits to verify our carbon footprint. These are carried out in accordance with the international Greenhouse Gas Protocol and refer to guidelines published by the Environmental Protection Department and the Electrical and Mechanical Services Department.

Three major GHGs – CO₂, CH₄ and N₂O, produced by our electricity and fuel consumption – are tracked closely. Other operating data will also be reviewed, to ensure that the audits are consistent and measurable, and that they faithfully reflect our performance.

CARBON EMISSIONS PRODUCED BY OUR OFFICE LOCATED AT THE QUEENSWAY GOVERNMENT OFFICES

The carbon emissions produced by our office located at the Queensway Government offices (QGO) have remained stable over the past five years.



	FY2015-16	FY2016-17	FY2017-18	FY2018-19 ^[3]	FY2019-20
Direct Emissions (Tonnes of CO ₂ e)	6.90	6.87	7.12	9.70	34.83
Energy Indirect Emissions (Tonnes of CO ₂ e) ^[1]	2,255.11	2,247.02	2,169.03	2,192.62	2,117.74
Other Indirect Emissions (Tonnes of CO ₂ e) ^[2]	83.78	95.09	29.61	72.53	68.95
Total (Tonnes of CO₂e)	2,345.79	2,348.98	2,205.76	2,274.85	2,221.52

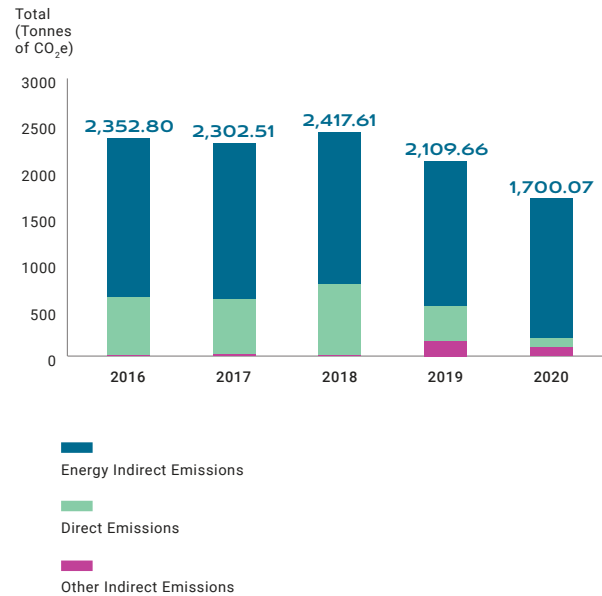
[1] A territory-wide default emissions factor was used to calculate these emissions.

[2] The figures were calculated by measuring the actual usage of fuel in mobile sources and paper consumption (A3 and A4) and wastepaper collected for recycling at QGO.

[3] The slight increment in total carbon emission recorded in FY2018-19 was due to the increase in fuel usage of mobile sources combustion for transportation needs to remote project sites; the increase in overall electricity consumption of commonly used facilities in QGO; and the decrease in paper recycling, which ArchSD has been persuading electronic digitisation and actively promoting Co-i in our office operation.

CARBON EMISSIONS PRODUCED BY APB CENTRE

Upgrades to the APB Centre's air conditioning, regular maintenance and the application of energy efficiency features resulted in a gradual drop of about 27.76% in carbon emissions in 2020 compared to 2016.



	2016	2017	2018	2019	2020
Direct Emissions (Tonnes of CO ₂ e)	628.22	601.86	769.69	370.63	102.79
Energy Indirect Emissions (Tonnes of CO ₂ e) ^[4]	1,719.53	1,686.67	1,642.88	1,576.60	1,503.58
Other Indirect Emissions (Tonnes of CO ₂ e)	5.05	13.98	5.04	162.43	93.70
Total (Tonnes of CO₂e)	2,352.80	2,302.51	2,417.61	2,109.66	1,700.07

[4] A territory-wide default emissions factor was used to calculate these emissions.

MANAGING WASTE



'Excellence Level'
Wastewi\$e Certificate

To support the government's advocacy on waste management, we encourage waste reduction at source and promotes active recycling across our branches and offices. Green housekeeping guidelines are issued to disseminate information about appropriate practices in waste reduction, recycling and handling. For example, the guidelines set out principles for paper consumption and reduction to avoid unnecessary wastage. At the APB centre and QGO, collection facilities are set up for the collection of various recyclables, including but not limited to

wastepaper, plastic bottles, used toner cartridges, aluminium cans and used CDs.

Additionally, we formulate annual targets to drive improvement progress, together with close monitoring on the implementation of different waste management programmes.

Our responsible waste management efforts have, for consecutive years, earned us an 'Excellence Level' Wastewi\$e Certificate (part of the HKGOC Scheme).

MANAGING WATER

We strive to conserve water resources by efficient water usage and deploying different water saving devices. We have installed auto-sensing taps and dual flush cisterns to avoid excessive use. We closely track consumption

and flushing, and regularly maintain the water supply system. Our green housekeeping circular outlines good practices to raise our staff's awareness of water conservation.

MANAGING INDOOR AIR QUALITY



'Good Level' Wastewi\$e Certificate

To ensure a green and healthy working environment, we adhere to good management practices suggested in the guidelines published by Environmental Protection Department and we support its voluntary Indoor Air Quality (IAQ) Certificate Scheme to pursue a good performance in IAQ. Our IAQ

performance is regularly assessed by accredited bodies.

During the reporting year, we are honoured that both APB Centre and QGO have been awarded 'Good Level' IAQwi\$e Certificates.

CULTIVATING ENVIRONMENTAL AWARENESS

ArchSD does not limit our efforts in resource efficiency improvement and pollution prevention, but also nurtures environmental awareness across our workplace and invites our staff to join the department's long-term environmental sustainability journey. We integrate green elements into our employees' work culture and make clear the part they play in environmental protection. To that end, we constantly disseminate environmental messages and reminders of good practices

via the intranet, emails and other communication channels to them.

We also encourage our staff to participate in activities and training sessions related to environmental initiatives, global issues, and trends, both internally and externally organised. During the year, in spite of pandemic situation, our staff took part in 36 environmental related training courses. We have also established a team of 74 Green Wardens to help spread green messages and

support the implementation of ArchSD's green programmes and activities. We also support employees to obtain professional qualifications in diverse environmental domains. For example, some of our staff members maintain the BEAM Pro green building-related qualifications. With the resources and time devoted, we believe that the environmental awareness and knowledge at all levels in ArchSD will increase.