Leading towards a Sustainable Future
Message from the Management

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In 2021, despite the disruption of the COVID-19 pandemic, CSHK worked tirelessly to overcome various challenges with sustained resilience and strong capabilities, getting through hard times together with the Hong Kong community.

Taking root in Hong Kong for more than 40 years, CSHK has been contributing to urban development through constructing high-quality residential housing estates, commercial buildings, public constructions, hospitals, schools, and other livelihood facilities following the corporate spirit of "exercise caution in details and implementation, build a strong foundation to seek greater success". A solid foundation has been laid for sustainability progress through endeavours in professional management, talent cultivation, construction technology innovation, quality technology management, safety and environmental management, among other aspects. Today, we respond to the challenges and opportunities brought by the ever-changing development of society through expanded corporate vision and business thinking. As we contribute to and inspire the construction sector, we bring continuous positive impacts to stakeholders and honour our commitment to creating a better world.

In 2021, CSHK enhanced our emphasis on formulating and promoting sustainability strategies, and integrated sustainability elements into our business strategies. Following the concept of "Building Consensus, Promoting Innovation, and Creating Value", we created greater value for society with stable management strategies, rich technical experience, and an attitude to advance with the times. CSHK was honoured to receive The Grand Award at the inaugural "Outstanding Contractor Award" (Major Contractor) organised by the Construction Industry Council. The accolade was an affirmation of our performance by the industry and society.
In particular, C-SMART 3.0, the upgraded version of our smart site management platform, has been applied to all ongoing projects with boosted efficiency. At the same time, we have applied MiC and DfMA technologies in a number of construction projects, improving engineering quality, safety, and environmental management.

In the beginning of 2022, another wave of COVID-19 outbreak brought unprecedented challenges to the Hong Kong community. CSHK once again took on the responsibility, working together with all sectors to ensure the supply of materials, personnel, equipment, and resources. Eight Community Isolation Facilities aided by the Central Government of China were completed within a minimum of time, taking advantage of MiC and innovative technologies such as the "Smart Site". Tireless efforts were made to contain the pandemic and safeguard the well-being of Hong Kong citizens.

In an age marked by uncertainty, we are sincerely grateful to the generous support of all stakeholders. Looking to the future, CSHK will redouble efforts to improve our management level with a sustainability mindset, accelerate the application of new technology, and contribute to the decarbonisation of the construction sector. We look forward to joining hands with all stakeholders for a more sustainable, beautiful, and liveable Hong Kong.

Mr. HUNG Cheung Shew, Danny
Chairman and President

The Hong Kong Special Administrative Region Government has pledged to achieve carbon neutrality by 2050. CSHK has been taking active carbon reduction measures to fully respond to the goal. To lead the low-carbon transition of the construction industry, Hong Kong Organic Resources Recovery Centre Phase 2 (O-PARK2) serves as our first carbon neutral construction pilot project, where carbon emissions are reduced throughout the life cycle of the project, from design, materials selection, construction, to operation and maintenance. To honour our environmental commitment, we incorporate energy conservation and emissions reduction into development and planning stages. We adopt green building and prefabricated building models to help improve the energy efficiency, water efficiency, material efficiency, and environmental benefits of the construction industry. We actively participate in projects related to environmental protection facilities, such as the design, construction, and future operation of Tseung Kwan O Desalination Plant. In addition, we assess and review the environmental impact of our business on a continuous basis, set environmental goals and targets each year, improve the environmental management level of our projects and offices, and reduce the pollution, carbon footprint, and resource consumption of our own operations.

We actively promote the all-round development of our employees and inspire and maintain outstanding teams. To address the talent gap in the industry, we recruit and nurture technical and knowledge-oriented professionals from the younger generation by organising various training schemes and workshops. To fulfil our corporate social responsibility, we extend care to all sectors of the community to “manage happiness” for society.

As one of the major contractors in Hong Kong, CSHK has been promoting the innovation and advancement of construction technology as an active response to "Construction 2.0" proposed by the Development Bureau. In view of the digital transformation of the construction industry and COVID-shifted corporate operation model and workstyle, we accelerated forward-looking digital reforms and developed C-SYS+, our industry-leading in-house enterprise data platform, bringing new breakthroughs to project management.

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Scan the QR code for more information.
**Sustainability Highlights**

### Promoting Innovation

BIM technology applied to

- **47** construction projects

Smart site technology applied to

- **21** construction projects

GHG emissions intensity (Scope 1 and Scope 2):

- **3.3** tonne of CO₂-e/HKD million

Keep driving

O·PARK2

### Building Consensus

Number of employees:

- **5,409**

Work-related injury rate per 1,000 persons:

- **2.4**

Percentage of employees who received training:

- **78%**

Keep driving CSHK’s first carbon neutral construction pilot project forward
| The “Hong Kong ‘Double Hundred’ Youth Development Program” to provide |
| 100+ jobs for fresh graduates | 100+ internship opportunities |

| Percentage of local procurement#: |
| 98% |

| Proportion of FSC certified timber purchased*: |
| 99.8% |

* Including building materials and construction machinery procurement
* Certified by British Standards Institution (BSI)

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| Creating Value |
| Amount of community investment: |
| HKD3,226,672 |

| Hours of volunteer work by employees: |
| 11,063 |

| Volunteers reached |
| 2,800 person-times |

“Hundreds of Homes for Maintenance” Scheme upgraded to “Thousands of Homes for Maintenance” Scheme
About CSHK

Overview

Founded in 1979, CSHK has obtained five top-tier Grade C construction licenses as Approved Public Works Contractors (commonly known as Grade C construction licenses) in its early days of establishment, actively bidding for various government projects, including “Buildings”, “Port Works”, “Roads and Drainage”, “Site Formation” and “Waterworks”. For more than 40 years, CSHK’s business scope covers building construction, civil engineering, foundation engineering, mechanical and electrical engineering, environmental protection engineering, factory production engineering and other construction-related businesses.

Undertaken

16% of Hong Kong Public Housing

Proportion of Hong Kong citizens living in housing built by CSHK:

1/15
Undertaken

20% of hospital facilities in Hong Kong

Area of reclaimed land equivalent to 1/9 of the size of Hong Kong Island (8.85 million square metres)

Undertaken

70% of water mains from Mainland to Hong Kong to supply fresh water

Daily average number of workers on CSHK’s construction sites accounts for 1/8 of the total industry workforce in Hong Kong
About CSHK

Governance Structure and Business

Corporate Structure

CSHK’s parent company, CSCI, is a vertically integrated construction and investment conglomerate, and was listed on the Main Board of The Hong Kong Stock Exchange (stock code: 03311) in 2005.
Business Overview

Since 1979, CSHK has been operating construction businesses encompassing building construction, civil engineering, foundation engineering, site survey, electrical and mechanical engineering, among other sub-sectors, and has developed investment, architectural technology products, and information technology business in recent years.

Engineering Business

Building Construction

Established in 1979, the Building Company is a pioneer in the contracting market in Hong Kong. The Building Company has always been pursuing stringent quality, safety and environmental management, mainly undertaking design and construction projects such as public buildings, hospitals, universities, and private and public estates.
Civil Engineering

Established in 1979, the Civil Engineering Company can undertake projects with unlimited tender amounts, including port works, roads and drainage, site formation, and waterworks with unlimited tender price, participating in site formation, highway, bridges, land reclamation, tunnels, rail transport, airport facilities and other construction projects in Hong Kong. In recent years, the Civil Engineering Company has expanded its business into new environmental-friendly projects, undertaking sustainable construction projects such as the desalination plant and the organic resources recovery centre.

Foundation Engineering

The Foundation Company was established in 1986 as the specialist contractor in the land piling category of the Development Bureau of Hong Kong, as well as the specialist contractor in the foundation, demolition, and site formation work categories of the Building Department of Hong Kong. The Foundation Company is committed to providing design and execution services of foundation engineering works, including large-diameter bored piles, small-diameter pipe piles, steel H-piles, diaphragm wall, underground grouting, and demolitions.

Mechanical and Electrical Engineering

The Mechanical and Electrical Engineering Company was established in 1996 to provide Electrical & Mechanical engineering services for projects in Hong Kong and Macau and has now ranked among the forefront of the electrical and mechanical engineering industry in Hong Kong. Its business mainly encompasses the provision and installation of HVAC system, electrical system, fire service system, extra low voltage electrical system, plumbing and drainage system, tunnel ventilation system, and town gas system, security systems, with business covering hospitals, hotels, public housing, private residents, shopping malls, commercial office buildings, industrial buildings, education and cultural centres, public buildings, roads, bridges, tunnels and more.
Business Overview

Other Business

Investment
The Overseas Development & Investment Department was established in 2014 with the aim of leveraging CSHK’s rich experience in the management of contracting and construction projects to amplify its influence and create a platform for contracting businesses driven by investment. Its business in Hong Kong includes acquisition and redevelopment of old buildings, revitalisation and redevelopment of industrial buildings, and joint-stock participation of the government’s open tendering of land investment projects. In the United Kingdom, the United Arab Emirates, Southeast Asia and other countries and regions, the Overseas Development & Investment Department focuses on investment projects on the development of student housing, real estates, industrial parks, small-scale infrastructure, and healthcare, driving the contracting business through investment.

Architectural Technology Products
Transcendence Company Limited was established in 2014 and is engaged in the business of construction technology products, positioning itself as a technology company rooted in the construction industry. Through independent research, development, and re-innovation of pioneering technology, Transcendence Company Limited provides integrated and intelligent solutions for different types of engineering projects with the C-SMART Smart Site System based on Internet of Things (IoT), artificial intelligence (AI), cloud computing, GPS positioning and BIM technologies. Smart Site includes a rich portfolio of solutions, such as face recognition attendance-recording system, real-time localisation of site personnel, AI-based monitoring of unsafe behavior, management of IoT devices, smart logistics management system, UAV real-time patrol, quality management system, visualisation of BIM progress, integrated platform, etc. It is an all-in-one monitoring platform for managers.
Information Technology
China Construction Information Technology Company was established in 2018 to carry out BIM-related business in Hong Kong and Macau. China Construction Information Technology Company has been researching and developing BIM technology for many years to provide all-encompassing BIM technological services and problem-solving solutions to clients, designers, and contractors, covering the architectural phases of planning and design, construction, and operational maintenance. It has participated in projects of public housing, hospitals, schools, residential estates, commercial complexes, airports, water treatment works, highways, bridges, tunnel, and large-scale underground space.

Medical
China State Construction International Medical Industry Development Co., Ltd. (CSIM) was established in 2019. Taking high-standard medical construction and high-quality medical operation as the core, CSIM is committed to providing international one-stop medical and rehabilitation services for the whole lifecycle from investment and financing, medical planning, design, procurement, construction to operation, training, and consulting, thereby delivering customers with products covering life and healthcare for all ages.

Insurance
China Overseas Insurance Limited was established in Hong Kong in 2001, and was authorised by the Office of the Commissioner of Insurance of the Hong Kong Special Administrative Region (currently known as the Insurance Authority) to operate general insurance business.
CSHK was established in Hong Kong

1981

Succeeded in obtaining five top-tier Group C construction license as Approved Public Works Contractors (commonly known as Group C construction licenses) to undertake government projects with unlimited tender amounts

1982

Contracted to build Muk Wu-Tai Lam Chung Aqueduct and Phase 2 of Tai Wo Hau Estate of The Hong Kong Housing Department; the latter of which was the Company’s first awarded construction contract with The Hong Kong Housing Department
China Overseas Land and Investment Limited (stock code: 00688), a subsidiary of COHL, was listed on the Hong Kong Stock Exchange to become the first Chinese enterprise to be listed with its Hong Kong-based business, engaging in real estate development and contracting business.

Rated as the best contractor by the Hong Kong Housing Authority for four consecutive years since 1992.

Contracted to build the infrastructure and the three major theme parks for Hong Kong Disneyland, becoming the first Chinese contractor for Disneyland.
Milestones

2005

- The contracting businesses in Hong Kong were split off from China Overseas Land and Investment Limited and were listed separately on HKEX as China State Construction International Holdings Limited (stock code: 3311.HK)

- Contracted to build the Princess Margaret Hospital Infectious Disease Centre

2010

Contracted to the construction of Central – Wan Chai Bypass Tunnel (Causeway Bay Typhoon Shelter Section), which was the highest-valued construction contract awarded to the Civil Engineering Company as a sole contractor at the time

2012

Contracted to the construction of Hong Kong-Zhuhai-Macau Bridge Hong Kong Link Road – Section between Scenic Hill and Hong Kong Boundary Crossing Facilities, which was the highest-valued construction contract awarded to the Civil Engineering Company as a sole contractor at the time

2013

Contracted to build Hong Kong Children’s Hospital, which was the highest-ever valued design and construction contract of the Architectural Services Department at the time
2014
Contracted to build the MGM Cotai project in Macau, which was the highest-valued contract CSHK had ever been awarded acting as a sole contractor.

2015
Contracted to build the Shatin to Central Link—Exhibition Station and Western Approach Tunnel.

2016
Contracted to build the CUHK Medical Centre.

2018
Contracted to the construction of the Sky Bridge of the Hong Kong International Airport.
Milestones

2019

- Contracted to build Tseung Kwan O Desalination Plant, Phase I and Hong Kong Organic Resources Recovery Centre Phase 2

2020

- Contracted to build the Quarantine Centre at Lei Yue Mun Park & Holiday Village (Site A and Site B), the Quarantine Centre at Penny’s Bay, the North Lantau Hospital Hong Kong Infection Control Centre, and the Community Isolation Facility at AsiaWorld-Expo

- Contracted to build the Hong Kong Palace Museum
2022

Contracted to build eight Community Isolation Facilities in Tsing Yi, San Tin, Hung Shui Kiu, Yuen Long, Fanling, and temporary quarantine facilities at Hong Kong Side of the Hong Kong-Zhuhai-Macau Bridge, as well as permanent community quarantine facilities at Kai Tak Cruise Terminal and Penny’s Bay.

2021

Contracted to build the Chinese Medicine Hospital and Government Chinese Medicines Testing Institute.
Specialising in the construction of high-quality, technical projects, CSHK has undertaken more than 800 projects in Hong Kong. These projects are closely related to the general public and cover various aspects of life, enhancing convenience for the community and improving quality of life.
Covering an area of 17,447 square metres, the Hong Kong Palace Museum is a key signature project of the Outline Development Plan for the Guangdong-Hong Kong-Macao Greater Bay Area, as well as a tribute to the 25th anniversary of the handover of Hong Kong.
Fire and Ambulance Services Academy at Tseung Kwan O

The Fire and Ambulance Services Academy at Tseung Kwan O is the most advanced fire training, teaching, and publicity base in Asia, comprising 29 buildings including teaching blocks, dormitories, a swimming pool, a running track, a fire simulation building, and a mock tunnel.
One and Two Chinachem Central

Contract Year: 2014 - 2017

Located at Des Voeux Road Central, Central, One and Two Chinachem Central have a total gross floor area of 21,137 square metres and comprise two 28-storey commercial buildings for office, restaurant and hotel uses.
Grand Victoria occupies a prime location, and will provide 1,437 units after completion, including underground garages and a waterfront promenade, with a total gross floor area of approximately 91,000 square metres.
The Regent is a landmark residential development in Tai Po, offering 1,620 units. During the construction process, we overcame the challenges of difficult construction and the impact of the epidemic to catch up and complete early by 100 days.
The project is Hong Kong’s first Chinese Medicine Hospital and also the Government Chinese Medicine Testing Institute. As the flagship of local Chinese medicine institution, the Chinese Medicine Hospital leads the development of Chinese medicine in Hong Kong. It is expected to provide 250 inpatient beds, 90 day inpatient beds, 40 children’s beds, and 20 beds for clinical trials and research centers. The hospital serves nearly 310,000 patients every year. The Government Chinese Medicine Testing Institute will set guidelines for the testing methods of Chinese medicine, support the research on the identifying and testing Chinese medicine, and establish internationally recognized accreditation guidelines for the safety, quality and testing of Chinese medicine.
North Lantau Hospital Hong Kong Infection Control Centre

Contract Year: 2020 - 2021

The North Lantau Hospital Hong Kong Infection Control Centre was built to international high quality hospital standards, completing the planning, design, construction, testing, and acceptance within 120 days. It is the first hospital in the world to be built with MiC, providing 816 negative pressure isolation beds.
Key Projects at a Glance

CUHK Medical Centre

Contract Year: 2016 - 2021

The CUHK Medical Centre is the first private hospital construction project in Hong Kong to include design, and is also the first non-profit, self-financing private teaching hospital. It has 516 inpatient beds, 28 operating rooms, 49 consulting rooms, as well as a 24-hour outpatient department.
Hong Kong Children’s Hospital

Contract Year: 2013 - 2017

The Hong Kong Children’s Hospital offers 468 beds, is the largest single-unit project of the Hong Kong government in the history during that time, the first public children’s hospital in Hong Kong, and one of the leading children’s hospital in Asia. The design and construction quality of the project was awarded “Quality Excellence Award”, which is the highest recognition of the “2020 Quality Building Award” in Hong Kong and other honours.
The Community Isolation Facility at AsiaWorld-Expo was completed in 472 hours to provide 952 beds, 160 of which are negative pressure isolation beds.
Quarantine Centre at Lei Yue Mun Park & Holiday Village Site A and Site B

Contract Year: 2020

The Quarantine Centre at Lei Yue Mun Park & Holiday Village Site A is the first quarantine centre newly established amid the coronavirus outbreak. It was built with MiC to complete 118 isolation units in 600 hours. Site A of this project was awarded the Brunel Medal—Highly Commended in the “ICE Awards 2020” by the Institution of Civil Engineers.
Studio City Phase 2, Macau

Contract Year: 2020 – Construction in Progress

Studio City Phase 2, Macau covers an area of 35,857 square metres, integrating entertainment facilities such as hotels, casinos, cinemas, water parks, and business centres and providing 876 hotel rooms with eight sky villas.
MGM Cotai, Macau is located on the Cotai Strip in Macau offering more than 1,400 guest rooms and suites. Its 8,073 square metre plaza canopy was built with a column-free vaulted grid glass roof, making a Guinness World Record.
Public Housing Development at Tsing Hung Road, Tsing Yi

Contract Year: 2019 – Construction in Progress

Located at 18 Tsing Yi Road, Kwai Tsing, the Public Housing Development at Tsing Hung Road, Tsing Yi provides two 41-storey residential blocks with a total of 2,868 residential units, a two-storey retail complex and a three-storey semi-underground building.
Three Runway System – North Runway Modification Works

Contract Year: 2021 – Construction in Progress

Three Runway System – North Runway Modification Works is an important part of the expansion of the third runway system of Hong Kong International Airport. It fully leverages technical prowess to speed up the commercialisation, and makes major contributions to significant international transportation pivot project.
Key Projects at a Glance

Tseung Kwan O–Lam Tin Tunnel and Associated Works

Contract Year: 2016 – Construction in Progress

The Tseung Kwan O-Lam Tin Tunnel is one of the sections of Route 6, including land formation, tunnel, elevated road and other landscaping works. Upon project completion, the journey between Kwun Tong and Tseung Kwan O will be shortened by about 10 minutes.
Sky Bridge at Hong Kong International Airport Terminal 1

Contract Year: 2018 - 2022

Located at the Hong Kong International Airport, the Sky Bridge is the long-span steel structured bridge at airports with the largest overall jacking weight and tallest height with curtain wall in the world, with enough space underneath the footbridge to accommodate the largest passenger aircraft currently in service.
Key Projects at a Glance

Central–Wan Chai Bypass Tunnel - Causeway Bay Typhoon Shelter Section and Slip Road 8 Section

Contract Year: 2010 - 2018

The Central-Wan Chai Bypass Tunnel project focused on technological innovation and adopted a number of low-carbon and innovative construction method, and won a number of awards for its outstanding performance in green construction while overcoming technical difficulties.
Hong Kong Organic Resources Recovery Centre Phase 2

Contract Year: 2019 – Construction in Progress

The project will be the largest organic waste recycling centre in Hong Kong, processing about 300 tonnes of organic waste per day for power generation. It is expected to avoid the emission of about 67,000 tonnes of greenhouse gases and reduce the disposal of about 110,000 tonnes of food waste to landfills annually, achieving the goal of turning waste into energy.
Design, Build and Operate First Stage of Tseung Kwan O Desalination Plant

Adopting advanced technologies such as reverse osmosis desalination and large diameter submarine pipe jacking technology, the first phase of the Tseung Kwan O Desalination Plant will be able to produce 135,000 cubic metres of fresh water per day upon completion, meeting 5% of Hong Kong’s fresh water demand.
The Relocation of Sha Tin Sewage Treatment Works to Caverns project is a representative project of Hong Kong’s Cavern Development Strategy, which actively promotes the application of innovative technology to enhance the overall performance of the project and bring long-term benefits to the community.
Major Awards and Honours

1. CSHK was awarded Grand Award of Outstanding Contractor Award (Major Contractor) by Construction Industry Council in HKSAR

2. The Hong Kong Children’s Hospital won two awards, namely the “Hong Kong Non-Residential” Grand Awards and the Quality Excellence Award at the Hong Kong “Quality Building Award 2020”

3. CSHK received “Hong Kong Spirit 2021” Group Awards from Hong Kong Ta Kung Wen Wei Media Group
CSCI was awarded the “Hong Kong Volunteer Award – Corporate Award (Category B)” at the 9th Hong Kong Volunteer Award, organized by the Hong Kong Volunteer Development Council, being the first batch of Chinese enterprises to win the award.

CSHK was awarded the “CarbonCare® ESG Label” for two consecutive years and was awarded the label at LEVEL 3, the only non-listed company to receive the award. In addition, the Organic Resources Recovery Centre, Phase II, was awarded the “CarbonCare® Construction (Process) Label” by the Hong Kong CarbonCare InnoLab for the first time and received the only highest rating (Gold) this year.
## Major Awards and Honours

### Comprehensive Strength, Corporate Governance, and Branding

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<tr>
<th>Award</th>
<th>Award-winning Unit</th>
<th>Issuer</th>
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<tbody>
<tr>
<td>Grand Award of Outstanding Contractor Award (Major Contractor)</td>
<td>China State Construction Engineering (Hong Kong) Limited</td>
<td>Construction Industry Council</td>
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<tr>
<td>Hong Kong Star Brand Award - Enterprise</td>
<td>China State Construction Engineering (Hong Kong) Limited</td>
<td>Organised by the Hong Kong Small and Medium Enterprises Association, and co-organised by Hong Kong Trade Development Council and Hong Kong Productivity Council</td>
</tr>
<tr>
<td>Hong Kong Spirit 2021</td>
<td>China State Construction Engineering (Hong Kong) Limited</td>
<td>Hong Kong Ta Kung Wen Wei Media Group</td>
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### Safety and Environmental Protection

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<th>Award</th>
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<tr>
<td>27th Considerate Contractors Site Award Scheme - Considerate Contractors Site Award - New Works Gold</td>
<td>Relocation of Sha Tin Sewage Treatment Works to Caverns – Site Preparation and Access Tunnel Construction</td>
<td>Development Bureau, Construction Industry Council, etc.</td>
</tr>
<tr>
<td>27th Considerate Contractors Site Award Scheme - Outstanding Environmental Management and Performance Award - New Works Gold</td>
<td>Relocation of Sha Tin Sewage Treatment Works to Caverns – Site Preparation and Access Tunnel Construction</td>
<td>Development Bureau, Construction Industry Council, etc.</td>
</tr>
<tr>
<td>International Safety Awards 2021 – Best Safety Performance in Hong Kong (Greater China)</td>
<td>APM and BHS Tunnels on Existing Airport Island Project</td>
<td>National Security Council</td>
</tr>
<tr>
<td>Green Construction Site Platinum Award</td>
<td>Development at Wong Chuk Hang Station, Phase 2</td>
<td>Kerry Properties</td>
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## Quality and Technology

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<th>Award</th>
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<tr>
<td>HKIE Innovation Award 2021 Grand Prize (Category II – An Innovative Application of Engineering Theories)</td>
<td>North Lantau Hospital Hong Kong Infection Control Centre</td>
<td>Hong Kong Institution of Engineers (HKIE)</td>
</tr>
<tr>
<td>2021 NEC Awards - Water Project of the Year and NEC Contract Innovation of the Year</td>
<td>Relocation of Sha Tin Sewage Treatment Works to Caverns</td>
<td>Institution of Civil Engineers</td>
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<tr>
<td>DFA Design for Asia Awards</td>
<td>North Lantau Hospital Hong Kong Infection Control Centre</td>
<td>Hong Kong Design Centre</td>
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<td>2021 HK Professional Excellence Winner of the Year</td>
<td>North Lantau Hospital Hong Kong Infection Control Centre</td>
<td>Australian Institute of Building (AIB)</td>
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<tr>
<td>2021 HK Professional Excellence Winner (Infrastructure)</td>
<td>Central - Wan Chai Bypass Tunnel (Slip Road 8 Section)</td>
<td>Australian Institute of Building (AIB)</td>
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<tr>
<td>2021 HK Professional Excellence Winner (Infrastructure)</td>
<td>Temporary Quarantine Facilities at Penny's Bay (Phase IIIB)</td>
<td>Australian Institute of Building (AIB)</td>
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<tr>
<td>2021 HK Professional Excellence Winner (Project Management)</td>
<td>North Lantau Hospital Hong Kong Infection Control Centre</td>
<td>Australian Institute of Building (AIB)</td>
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<tr>
<td>2021 HK Professional Excellence Winner (Residential)</td>
<td>Residential Development at Tai Po Town Lot No. 221</td>
<td>Australian Institute of Building (AIB)</td>
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For more information about the awards and honours, please refer to the Group's 2021 Annual Report (P.48-49), and CSHK’s website.
Message from the Management

Sustainability Highlights

About CSHK

Sustainability Special Issue: Towards Carbon Neutrality
Sustainability Special Issue

Towards Carbon Neutrality
Path to Low-Carbon Transition of CSHK

Construction industry faces an urgent need of low-carbon transition

Climate change is a major challenge for the global community. States and local governments around the world are taking active steps towards climate mitigation and adaptation. In succession to the Kyoto Protocol, the Paris Agreement came into effect on November 4, 2016, which calls for joint global action and inter-organisational collaboration for more progressive climate action, with a view to:

- Peak greenhouse gas (GHG) emissions as soon as possible and achieve carbon neutrality by 2051-2100; and
- Limit the global average temperature rise to below 2°C above pre-industrial levels, and aim for 1.5°C.

In 2017, the Hong Kong government announced carbon emission targets in Hong Kong Climate Action Plan 2030+, which expects an absolute reduction of 26% to 36% by 2030. Moreover, the latest Hong Kong Climate Action Plan 2050 proposed four major decarbonisation strategies, namely net-zero electricity generation, energy saving and green buildings, green transport, and waste reduction.

The construction industry faces an urgent need of low-carbon transition, as its lifecycle carbon emissions accounted for 50.6% of the national total in 2019. According to the Hong Kong Construction Industry Council (CIC), the construction industry should seek to achieve an 11% reduction against business-as-usual in 2030.

In 2020, China announced that “China will increase its National Determined Contribution and adopt more powerful policies and measures, strive to peak carbon dioxide emissions by 2030, and achieve carbon neutrality by 2060.”

As a low-carbon transition leader of Hong Kong’s construction industry on behalf of CSCI, CSHK has been actively working on various aspects to contribute to CSCI’s carbon neutral strategy and carbon reduction targets. Efforts have been made in line with CSCI’s short-term target of reducing carbon emission intensity by 25% by 2025 (2018 as base year) and long-term target of achieving carbon neutrality by 2060.

Set an example for the industry by action

With our roots entrenched in Hong Kong for more than 40 years, we have taken the sustainability vision of “developing into a world-class and sustainable corporation with international construction and infrastructure investment” as our goal, moving the construction industry towards a greener future.

Over the years, we have continuously reviewed and improved our sustainability efforts and performance. We strive to explore a contractor’s path to low-carbon transition while upholding our sustainability strategy that focuses on “Building Consensus”, “Promoting Innovation”, and “Creating Value”. Faced with the huge challenges brought by climate change, CSHK has made active moves to respond to the global call for carbon neutrality. The Carbon Neutrality and Carbon Asset Development Committee and Working Group were established in June 2021 as governance structures for low-carbon development at decision-making and execution levels. The two structures enable senior managers of the Company to work with subsidiaries and functional departments, thereby enhancing our competitiveness in green and low-carbon construction.

CSHK Carbon Neutrality and Carbon Asset Development Committee

The Chairman of the Committee is assumed by Chairman and President of CSHK. Members of the Committee are leaders of Engineering, Safety, Environmental Protection, Supply Chain Management, Human Resources, Quality, and Technology Innovation departments. The Corporate Communications Department manages the routine works of the Committee, with CSHK’s sustainability leader acting as the Secretary.

The Committee is responsible for promoting and managing low-carbon construction and carbon asset development at CSHK.

CSHK Carbon Neutrality and Carbon Asset Development Working Group

The leader of the Working Group is assumed by head of the Corporate Communications Department. Members of the Working Group are key personnel from Engineering, Safety, Environmental Protection, Supply Chain Management, Human Resources, Quality, and Technology Innovation departments, with CSHK’s sustainability leader acting as the Secretary.

The Working Group is primarily responsible for assisting the Committee in its work, identifying carbon-neutral construction projects and projects suitable for carbon asset development, and preparing relevant materials and implementation plans.
CSHK Carbon Neutrality and Carbon Asset Development Committee

Chairman: Mr. HUNG Cheung Shew, Danny (Chairman and President)

Member Mr. Huang Jiang (Executive Vice President)

Member Mr. Zhang Ming (Vice President)

Member Mr. LAU Wing Shing (Vice President)

Member Mr. Shao Ruizhe (Assistant President)
Progress Towards Carbon Neutrality in 2021

Pioneer in Hong Kong - Piloting ultra-low carbon construction technology

To further implement the sustainability goals of CSHK and to explore the possibility of realising carbon neutrality during the construction phase, Mr. HUNG Cheung Shew, Chairman and President of CSHK, approved Hong Kong Organic Resources Recovery Centre Phase 2 (O-PARK2) as a demonstration project of ultra-low carbon construction technology at the first meeting of the CSHK Carbon Neutrality and Carbon Asset Development Committee.

In addition, as CSHK kicked off the O-PARK2 pilot project, the Company issued the first carbon neutrality commitment in Hong Kong in November 2021. At the same time, CSHK summarised reproducible carbon reduction practices of the project to facilitate steps towards sustainability at other sites, thereby steadily contributing to the Group’s sustainability strategy.
Prohibit greenwashing – Engage trusted third party for carbon audit

CSHK has been positively cooperating with the Group in GHG emissions disclosure. In March 2021, the Group hired the British Standards Institution (BSI), an international certificate authority as an external consultant for its business in Hong Kong. The entity conducted an audit on the GHG data of four projects to ensure its authenticity, completeness, and accuracy. In the future, CSCI plans to extend GHG data audit to other projects. The Carbon Neutrality and Carbon Asset Development Committee of CSHK has also carried out relevant work at the current stage, accumulating experience to prepare for the future. In the O·PARK2 case, its carbon emissions data and carbon reduction achievements have been authenticated by third-party and has been awarded the “CarbonCare® Construction (Process) Label” with Carbon Neutral rating.

CSHK was the only organisation to receive this certification in 2021. We also plan to purchase carbon credits certified by international bodies such as Gold Standard and VCS after the construction phase to offset outstanding carbon emissions, achieving carbon neutrality during the construction phase.
Live up to expectations – Achieving annual sustainable performance goals

As the government strives to develop Hong Kong into a leading hub for green and sustainable finance in Asia and achieve carbon neutrality by 2050, the Hong Kong Construction Industry Council (CIC) formulated and launched the Sustainable Finance Certification Scheme in 2021. In November 2021, CSCI became one of the first 16 certified organisations. As we continue to actively cooperate with the Group, we have sustained a leading position in sustainability in the construction industry both in Hong Kong and on a global scale. By doing so, we laid a solid foundation for sustainable financing in the Hong Kong construction industry and propelled Hong Kong in becoming a green and sustainable city.

CSCI has set up three targets for sustainable performance while building up the green finance framework. In 2021, CSHK not only achieved two of them, namely reducing GHG emissions and lowering work-related accident rate per 1,000 persons, but also emerged as a pioneer in the procurement of green building materials.

We undertake that CSHK will use 100% of FSC-certified timber by 2025.

<table>
<thead>
<tr>
<th>Key Performance Indicators</th>
<th>Target in 2021</th>
<th>Performance in 2021</th>
</tr>
</thead>
<tbody>
<tr>
<td>GHG Intensity (Scope 1 and Scope 2 by revenue)</td>
<td>16.33 tonne of CO₂-e/HKD million (reduced by 1.5% compared to the base year of 2019)</td>
<td>12.94 tonne of CO₂-e/HKD million (exceeding the target by 20.8%)</td>
</tr>
<tr>
<td>Work-related accident rate per 1,000 persons</td>
<td>Lower than 7.5  (since 2020)</td>
<td>3.33²</td>
</tr>
<tr>
<td>Use of FSC-certified timber (sourced by CSHK)</td>
<td>Use 100% of FSC-certified timber by 2025; use 88% of FSC-certified timber in 2021.</td>
<td>99.8%³</td>
</tr>
</tbody>
</table>

² Verified by the British Standards Institution (BSI). The figures include employees of the Group and workers such as sub-contractors.
³ Verified by the British Standards Institution (BSI).
Carbon Neutral Construction Pilot Project During Construction Phase

O·PARK2 Project Background
As a carbon neutral construction pilot project during the construction stage, O·PARK2 targets sustainable construction by turning waste into energy, reducing carbon emissions and environmental pollution, extending the service life and reducing the burdens of landfills. O·PARK2 is expected to start operation in 2024. By that time, it is estimated to process 300 tonnes of food waste every day, which, after being recycled with other organic waste, can be turned into thermal energy, electricity, biofuels, and soil conditioner.

It is estimated that once completed, O·PARK2 will reduce GHG emissions by 67,000 tonnes and food waste in the landfills by 110,000 tonnes, effectively improving Hong Kong’s food waste recycling system. Moreover, O·PARK2 will use anaerobic digestion technology to convert food waste into biogas for power generation. In addition to meeting the demand of the power and heating supply for its facilities, it can churn out 24 million kWh of surplus electricity every year, which is equivalent to the electricity consumption of about 5,000 households. Given the eco-friendly and waste-to-energy nature of O·PARK2, while trying to achieve carbon neutrality during the construction phase, CSHK is also actively exploring the possibility of carbon asset development during project operation. By doing so, CSHK aims to contribute to the Group’s sustainability goals and set the trend of low carbon transition in Hong Kong’s construction industry.
# Carbon Neutrality Roadmap of O·PARK2 during Construction Phase

**July-August 2021**

Collect environment data on energy, building materials, transportation, mechanical equipment uses, and other aspects at O·PARK2 sites and examine the current and future carbon emissions to help formulate carbon reduction strategies.

**September-October 2021**

- **Measure Carbon Footprint**
- **Develop Carbon Neutrality Plans**

**Formulate detailed carbon reduction strategies and implement them during the construction phase**
- Sustainable management
- Technological innovations
- Encourage Voluntary Emission Reduction

**Implement emission reduction strategies:**
- Adopt the BIM7D system and the DfMA building method
- Build site offices using MiC technology
- Install solar power panels on the roofs of site offices to generate power
- Replace fuel vehicles with electric vehicles
- Use low-carbon steel with 100% recycled content
- Use low-carbon concrete
- Replace fuel generators with energy storage batteries
- Power machinery and equipment with biodiesel
- Monitor real-time emission data on the carbon neutrality cloud platform
<table>
<thead>
<tr>
<th>Annual Assessment Performance Report</th>
<th>Audit Carbon Footprint</th>
<th>Accomplish Carbon-neutral Statement</th>
</tr>
</thead>
<tbody>
<tr>
<td>April-May 2022</td>
<td>2024</td>
<td>2024</td>
</tr>
</tbody>
</table>
| Calculate actual annual carbon footprint, assess carbon reduction measures, and adjust carbon neutrality strategies. | Calculate actual carbon footprint upon project completion and engage an authoritative third party for auditing. | • Offset outstanding carbon emissions by purchasing carbon credits  
• Disclose relevant research data on carbon neutrality  
• Release carbon-neutral statement |
Measure Carbon Footprint

To keep track of the actual GHG emissions during the O·PARK2 construction phase, CSHK planned and carried out GHG quantification related work. The carbon emissions of O·PARK2 were audited by our external consultant CECEP Environmental Consulting Group. Strictly following ISO 14064-1:2018 compiled by International Organisation for Standardisation (ISO), they identified the direct and indirect carbon emission sources of facilities operated and managed by CSHK and quantify their emissions. By doing so, they established the GHG emissions list of the project, ensuring the authentic and fair disclosure of GHG emissions of the project during the construction phase.

The next step of carbon accounting is to identify, quantify, and analyse potential directions and measures for carbon reduction, and to make carbon reduction strategies, lying a solid foundation for CSHK to deliver the first carbon neutral construction pilot project during construction phase in Hong Kong.

Establish Carbon Neutrality Plans

Strictly following the construction phase carbon neutrality roadmap of O·PARK2, CSHK conducted carbon accounting and formulated the carbon reduction strategies correspondingly. According to the accounting, the embodied emission of building materials accounted for more than 80% of total emissions during the construction phase. Therefore, reducing carbon emissions from the upper reaches of the value chain is indispensable for construction phase carbon reduction. Meanwhile, CSHK actively cooperated with other players in the value chain of the project when formulating the construction phase carbon reduction plan, meeting developers’ requirements for construction design, and cooperating with suppliers to purchase low-carbon building materials at the same time. For different types of emissions, CSHK has formulated different carbon reduction measures:
<table>
<thead>
<tr>
<th>Carbon Reduction Measures</th>
<th>Site</th>
<th>Office</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Scope 1</strong>&lt;br&gt;(Direct emissions)</td>
<td>• Promote construction site electrification, connect to the grid as soon as possible, or set up temporary transformers to power the sites, replace traditional power generators with Enertainers</td>
<td>• Promote low-carbon travel, use biodiesel and electric cars</td>
</tr>
<tr>
<td><strong>Scope 2</strong>&lt;br&gt;(Energy indirect emissions)</td>
<td>/</td>
<td>• Set environmental protection targets in site offices, including the application of energy-efficient appliances and equipment, setting up energy-saving reminders and automatic power switches with motion sensors, installing and promoting sustainable energy facilities</td>
</tr>
<tr>
<td><strong>Scope 3</strong>&lt;br&gt;(Other indirect emissions)</td>
<td>• Use BIM7D innovative technology platform and management system for design, construction, operation and maintenance&lt;br&gt;• Use DfMA to simplify the manufacturing and assembly process and reduce material consumption.&lt;br&gt;• Improve supply chain management and use low-carbon materials&lt;br&gt;• Set site environmental management objectives on wastewater recycling, waste material recycling through separation, resource conservation, prevention of unnecessary building material consumption, etc.</td>
<td>• Use the C-SMART Site Management Platform and reduce paper use&lt;br&gt;• Recycle and re-use MIC offices to reduce the carbon footprint of temporary site offices</td>
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</table>
Audit Carbon Footprint

At present, with the assistance of external consultants, the O-PARK2 Carbon Neutrality Working Group has completed the accounting of carbon emissions in 2021. During the period from 1 January 2021 to 31 December 2021, the total emissions of the project were 12,886 tonnes of CO₂-e. The Working Group is discussing the purchase of certified carbon credits. In addition, in order to ensure the authenticity, completeness and accuracy of the carbon emissions audited, upon project completion, the Working Group will engage a third-party auditor to audit its carbon emissions during construction phase. This is to ensure that the purchased carbon credits will be sufficient to offset the outstanding carbon emissions during construction phase, helping the project achieve carbon neutrality.

As of December 2021, CSHK has implemented a variety of carbon reduction measures on the project, including installing solar panels, adopting low-carbon building materials, etc., and has recorded the effectiveness of such measures. The project started to use low-carbon steel bars with 100% recycled content in 2021, which has amounted to a total of 5,270 tonnes. The average recycled content of steel bars has increased by 68% since the adoption of carbon reduction measures, reducing embodied carbon by 59%. In December 2021, we installed 213 square metres of solar panels (peak power 33.33kW) on the roof of the site office. The system was put into operation in Mid December 2021 and generated 1,622 kWh of electricity in the second half of the month, of which 1,534 kWh was consumed on site and the rest was exported to the grid.
Accomplish Carbon Neutrality Statement

So far, a number of standards for certifying Voluntary Emission Reduction (VER) programmes have been issued in China and overseas, including the Gold Standard, Voluntary Carbon Standard (VCS), China Certified Emission Reduction (CCER) Scheme, etc. CSHK will purchase VER credits to offset outstanding carbon emissions and achieve a carbon-neutral project based on the requirements of the O·PARK2 demonstration project, the extent of application and applicability of VER programme certification standards, among other factors.

Release Project Outcomes

To further support the low-carbon transition of the Hong Kong construction industry, we plan to share what we have learned from the O·PARK2 project with the public on the project website and through our Sustainability Report. Besides, we expect to launch a series of exploration plans, including exchanges with colleges and universities on research topics related to carbon emissions reduction. We aspire to translate our gains from the project into valuable products and services through sharing information and research achievements, stimulating technological innovation, promoting the transformation of research achievements and industrial upgrading. In addition, CSHK will make every effort to support the Greater Bay Area to transition to a low-carbon economy. We will continue to explore green buildings and the feasibility of carbon asset development at construction phase, thereby promoting the carbon trading market in the Greater Bay Area.

As of December 2021, CSHK reduced carbon emissions by 4,151 tonnes of CO$_2$-e through embracing low-carbon steel bars with 100% recycled content and power generation by solar panel which is equivalent to the amount of CO$_2$ absorbed by 180,489 trees in one year.
Low-carbon Construction Strategy Inspired by O·PARK2 at CSHK

In keeping with evolving social trends, businesses need to consider the social and environmental impacts of their businesses in addition to pursuing profits for investors. For that reason, we have been exploring the emission reduction potential of different projects and thereby striving to upgrade our low-carbon construction strategies. It allows us to respond to the public’s expectations of CSHK and contribute to the mitigation of climate challenges. We honour our commitment to compliant construction practices and implement green development concepts through comprehensive and steady management. The experience summarised from the O·PARK2 pilot project has inspired us to formulate and improve low-carbon construction strategies by focusing on sustainable management, technological innovation, and third-party audit.

1. Sustainable Management

To reduce carbon emissions during construction phase, we have continuously promoted digital management, refined management, and smart management of construction sites. We enhance the efficiency of natural resources to reduce construction waste and strictly abide by green procurement policies to minimise the environmental impact of our supply chain. Meanwhile, we have been committed to strengthening carbon-related information disclosure. In terms of sustainable management, we have adopted the following strategies.
1. Strengthen carbon-related information disclosure

- CSHK has been disclosing its sustainability performance since 2019 in its annual Sustainability Report. Research outcomes from the project will be shared with the public through media, websites, and sustainability reports on a continual basis.

- In addition, CSHK developed its in-house "Carbon Neutrality Cloud Platform" to collect and display the carbon emissions of different projects through its data platform — C-SYS+. Relying on the Group's internal sustainability data cloud platform, CSHK's platform provides the integration of internal data and enables digitised carbon accounting. Besides, the platform regularly updates and displays the GHG emissions and distribution of various projects as well as the effectiveness of carbon reduction measures on a dynamic basis. In doing so, the platform greatly simplifies data collection and enhances data accuracy while helping decision-makers to grasp carbon emission facts of the Group and formulate countermeasures accordingly. It has laid the foundation for carbon asset development, trading, and management in the future.
<table>
<thead>
<tr>
<th>Sustainable management</th>
<th>Low-carbon construction strategies</th>
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</table>
| **2. Actively participate in the design and construction of sustainability related projects** | • CSHK increases the productivity of consultants and contractors during design, construction, and during full building life cycle through continuously expanding the application of BIM. Maximum benefits are achieved by incorporating sustainable construction concepts and pursuing optimisation in building geometry, spatial relationships, and resource utilisation.  

• During design and construction, we pay attention to the impact of the works on the construction site and its surroundings. Increase greenery by keeping more native plants and improving design, so as to ensure that the building fits its surrounding environment. |

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<tbody>
<tr>
<td><strong>3. Integrated smart site management</strong></td>
<td>• C-SMART is a smart site management platform developed by Transcendence Company Limited, a wholly-owned subsidiary of CSHK, for achieving digital, refined and smart management while reducing carbon emissions from the routine management of project sites. The platform collects and aggregates the information on site personnel, safety and environmental protection, construction progress, and materials into an integrated information management platform based on in-house developed face recognition, IoT, and AI technologies. C-SMART analyses the data on the platform, assist the construction management decision-making of the project and enable intelligent monitoring and comprehensive management.</td>
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</table>
4. Supply chain management

- CSHK has stated its requirements on green procurement in its Procurement Policy and Supplier’s Code of Conduct, prioritising procurement in close proximity and of environmentally friendly materials, and ordering goods on demand, and in strict accordance with the quantity requested by construction sites and fits project needs, in order to reduce carbon emissions and waste of resources. On the basis of green procurement, we will further explore low-carbon building materials available in the market. We will give preference to low-carbon steel bars with 90% recycled content and replace cement (accounting for 60% of concrete) with GGBFS, thereby minimising embodied carbon emissions of our projects. In addition, we will promote CO₂ mineral carbonation curing technology of concrete on the basis of CCUS (Carbon Capture, Utilization and Storage), a key frontier technology to address global climate change.
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</thead>
<tbody>
<tr>
<td><strong>5. Project environmental management</strong></td>
<td>• CSHK requires every project to prepare a project-specific Environmental Management Plan, which shall be regularly reviewed and implemented. In addition, CSHK calls for improving resource efficiency and reducing construction waste by optimising design, processes, and materials management. So far, all projects have been certified to comply with ISO 14001:2015 Environmental Management System. In addition, an integrated site management working group will be set up at each project, with the site manager as the first responsible person to conduct integrated management for the project’s environmental protection work.</td>
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<tr>
<td></td>
<td>• Project-specific environmental management objectives are formulated regarding water conservation, energy conservation, resource conservation, site electrification and waste disposal, ensuring that environmental protection tasks are carried out at all sites.</td>
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</table>
2. Technological Innovation

CSHK has always dedicated itself to promoting innovation in technology. While pursuing excellence in construction quality, safety and environmental protection, we have been leading our employees and partners into Construction 2.0 through the development and extensive use of construction technology. In order to realise the low-carbon construction and continue to explore the possibility of carbon neutrality, in addition to strengthening sustainable management, we also emphasise incorporating technological innovation with construction practices. To this end, we have applied innovative technologies in design and construction phases, promoted the application of new technologies such as MiC and BIM throughout the building lifecycle, and implemented eco-friendly design and construction practices even in the future operation. Our measures and implementation plans are as follows.

<table>
<thead>
<tr>
<th>Technological Innovation</th>
<th>Implementation Plan</th>
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<tbody>
<tr>
<td>1. Adoption of DfMA and MiC technologies</td>
<td>• Further encourage projects to leverage MiC to build site offices, so as to shorten construction time, limit the disturbance of office construction on project works, reduce pollution, and improve engineering quality. Site offices will be reused and rebuilt in modules at the end of the project, to further reduce carbon emissions generated in the construction phase.</td>
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<td></td>
<td>• Expand the application of DfMA in certain structures of projects, thereby further reducing the carbon footprint of our projects. According to our internal estimations, CSHK’s prefabricated projects can reduce wood consumption by 80%, noise and construction waste by 60%, and human resources by 50% compared with traditional construction methods.</td>
</tr>
<tr>
<td>Technological Innovation</td>
<td>Implementation Plan</td>
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</table>
| 2. BIM 7D Design, Construction, Operation and Maintenance Innovation Technology Platform | • Apply BIM technology in project construction, such as 3D model guidance for collision examination, 4D model guidance for construction process simulation, 6D model guidance for construction survey, and 7D model for operation and maintenance. BIM enables clear access to all equipment information and leads the industry towards efficient management.  

• Explore the 7D application of BIM and connect the models to the carbon assessment tools of the Construction Industry Council to simplify the carbon assessment process. |
### Technological Innovation Implementation Plan

| **3. Introduction of innovative materials** | • Capitalise on new materials and technologies such as blast furnace slag cement and cast-iron high-density protective layer for corrosion protection, ensuring acid-resistant, heat-resistant, aging-resistant, abrasion-resistant food waste treatment processes. Enhance environmental performance by extending the service life of the machines. |

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### Third-Party Audit

In order to promote the Group’s sustainability strategy and cooperate with the Group’s carbon emission data accounting work, the CSHK Carbon Neutrality and Carbon Asset Development Committee will continue to carry out carbon emission accounting on each project, and explore carbon credits and carbon offsetting. Apart from this, to ensure the accuracy and authority of the carbon emissions data of our projects, CSHK will engage authoritative third-party auditors to audit the carbon emissions of projects that are in the process of carbon accounting. CSHK plans to capitalise on the works and studies carried out at the pilot project, as well as opportunities brought by upcoming sustainability-related projects. By doing this, CSHK will continuously promote the concept of carbon neutrality to all applicable projects undertaken by the Company, thereby stepping up the low-carbon transition of the Hong Kong construction industry.
Sustainability Special Issue: Community Isolation Facilities
Promoting Sustainability
Promoting Innovation
Building Consensus
Creating Value
Appendix
Sustainability Special Issue

Community Isolation Facilities
Message from the Management

Sustainability Highlights

About CSHK

Sustainability Special Issue: Towards Carbon Neutrality
Construction of Eight Community Isolation Facilities

Complete delivery within four months

In the beginning of 2022, Hong Kong saw an increasing number of COVID-19 infections amid the fifth wave of the severe pandemic which overwhelmed the local healthcare system. To ease the heavy burdens on the public healthcare system, the Hong Kong government requested support from the Central Government of China. CSHK once again took on the important responsibility to work with all parties involved and completed Community Isolation Facilities projects. United in our belief of “act together against COVID-19” and “time is life”, we managed to completely deliver the Community Isolation Facilities aided by the Central Government within four months by virtue of drawing on our experience and excellent performance on previous anti-epidemic projects. CSHK fully delivered the Community Isolation Facilities projects supported by the central government within four months. Equipped with a total of 40,000 beds, the facilities played a positive role in Hong Kong’s COVID-19 responses.
Construction of Eight Community Isolation Facilities

**Fully delivered six temporary Community Isolation Facilities within 29 days**

**Community Isolation Facility in Tsing Yi**
- Date of Delivery: 1.3.2022
- Completed in merely seven days
- Site area: approx. 60,000 square metres
- Floor area: approx. 30,000 square metres
- Beds: 3,900+

**Community Isolation Facility in San Tin**
- Date of Delivery: 9.3.2022
- Site area: approx. 38,000 square metres
- Floor area: approx. 15,000 square metres
- Beds: 2,800+

**Community Isolation Facility on the artificial island where the Hong Kong-Zhuhai-Macau Bridge Boundary Crossing Facilities are located**
- Date of Delivery: 12.3.2022
- Site area: approx. 24,000 square metres
- Floor area: approx. 8,000 square metres
- Beds: 1,200

**Community Isolation Facility in Fanling**
- Date of Delivery: 13.3.2022
- Site area: approx. 20,000 square metres
- Floor area: approx. 7,400 square metres
- Beds: 1,000+
Community Isolation Facility in Hung Shui Kiu

Date of Delivery: 17. 3. 2022
Site area: approx. 32,000 square metres
Floor area: approx. 16,000 square metres
Beds: 2,300+

Community Isolation Facility in Yuen Long

Date of Delivery: 24. 3. 2022
Site area: approx. 100,000 square metres
Floor area: approx. 50,000 square metres
Beds: 9,400+

Quarantine Centre in Penny’s Bay

Date of Delivery: 21. 6. 2022
The largest among all projects aided by the Central Government
Two-storey building
Beds: 14,000+

Quarantine Centre in Kai Tak

Date of Delivery: 21. 6. 2022
Four-storey building
Beds: 6,000+

Two permanent buildings in the second batch completed and delivered within 122 days

Promoting Sustainability
Promoting Innovation
Building Consensus
Creating Value
Appendix
CSHK’s key anti-epidemic experience —
Early-stage Community Isolation Facilities
As a leading contractor in the construction industry, CSHK participated in the construction of multiple treatment and quarantine projects in 2020 and 2021 as the pandemic struck Hong Kong, including the Quarantine Centre at Lei Yue Mun Park & Holiday Village (Site A and Site B), Quarantine Centre at Penny’s Bay (Phase 1B and Phase 3B), Makeshift Hospital, and Community Isolation Facility at AsiaWorld-Expo. CSHK undertook projects under the Design-Build model and adopted MiC technology in the construction process to reduce on-site works and improve construction quality. Eventually, CSHK successfully completed high-quality projects in a short period of time. The practices also laid a solid foundation for anti-epidemic projects in the next stage.
Community Isolation Facility at AsiaWorld-Expo

Makeshift Hospital

Community Isolation Facility at AsiaWorld-Expo
Rising to the challenge — Ensuring the successful completion of projects

The Community Isolation Facilities this time posted greater challenges than previous anti-epidemic projects. In the face of the rapid development of the pandemic, the scale of the projects was even larger and the construction schedule was even tighter. The challenges brought by the construction of the eight Community Isolation Facilities were undoubtedly enormous for CSHK. Faced with numerous difficulties, with the support of the Central Government and the Hong Kong government, and under the coordination of the Group, CSHK maintained close communication and active coordination with government and related departments, subcontractors, and suppliers during the construction. In the face of challenges such as a tight supply of construction materials, inconvenient transportation and different construction standards between the Mainland and Hong Kong, the Liaison Office of the Central People’s Government in the Hong Kong Special Administrative Region (LOCPG), the Hong Kong government, and CSHK set up a tripartite liaison mechanism and high-level communication and coordination channels to clarify and continuously improve the construction and use standards for emergency projects, including the establishment of project construction standards for temporary construction of box houses, which contributed to the unprecedented speed of construction of all projects.

In terms of transportation, in addition to utilising our supplier and supply chain resources to quickly screen high-speed and reliable suppliers and logistics teams, and to procure and deliver as far in advance as possible, CSHK has also established central warehouses to ensure sufficient supplies for each project. At the same time, to guarantee logistics, we have used waterways and railroads to relieve the pressure of transportation.

7,775
modular unit per-assemble and shipped in 19 days
Every second counts — Temporary Community Isolation Facilities completed

There are two batches of Community Isolation Facilities, the first batch of which are six temporary Community Isolation Facilities located in Tsing Yi, the former site of the Boxes in San Tin, the Hong Kong Boundary Crossing Facilities Island of the Hong Kong-Zhuhai-Macao Bridge, Ma Sik Road in Fanling, Hung Shui Kiu near Kai Pak Ling Road and Tam Mei in Yuen Long. These projects are the first attempt to build "prefabricated modular houses" in Hong Kong. Most of modular houses have been assembled in factories in the Mainland and then transported to the site for installation. And the project design, procurement of materials, site formation, construction of main structure, electrical and mechanical installation, furniture arrangement, etc. were completed within one month, which greatly shortened the construction schedule.

Construction miracle — extremely fast construction of anti-epidemic facilities

To race for time and save lives, on 22 February 2022, the first temporary Community Isolation Facility aided by the Central Government started construction in Tsing Yi. We realised that the construction of the facility was a life-saving project, a race against time. CSHK mobilised all the forces and resources we could, detailed the plan down to the hour or even the minute, and devoted ourselves to the project. We also set up a special isolation and quarantine facilities construction team, mobilised materials from all over the country, organised the production of related materials for emergency stock, and mobilised various resources to provide support for the project construction.

The modular box houses used in the construction of the project were all supplied from the Mainland. We actively worked through the processes of customs, terminals, and shipping companies to ensure that the products arrived in Hong Kong in the shortest possible time. In the end, the project team completed the construction of about 60,000 square metres in just 7 days, equipped with basic furniture and bedding, air-conditioners, smoke detectors, fire extinguishers, and other facilities. It was a miracle for the construction industry in Hong Kong and a booster for the anti-epidemic work in Hong Kong.
In addition to the construction of the Community Isolation Facility in Tsing Yi, the project team also worked on the construction of the Community Isolation Facility in Yuen Long. In addition to the tight construction schedule, the scale of the Yuen Long Community Isolation Facility is larger than that of Tsing Yi, and the project site is a swampy grassland, making the land formation and hardening work relatively more difficult. Due to heavy rainfall for several days prior to the commencement of the project, the project team had to use excavators to clear the turf, vegetation, and silt from the grass and part of the marshland, and then replace a large amount of slag and harden it with 300-500mm thick concrete. To improve the ability to withstand heavy rainfall, the project team set up a 1m high central axis across the whole plot to form a natural flow system from the middle to the two sides.

In addition, the project team also took into account the subsequent use of the Community Isolation Facility in the Yuen Long. Therefore, the design of the project’s potable water pipelines, sewage system, electrical pipelines, and drainage barrels was planned and implemented according to the standards of permanent municipal works, including:

- Designed 970 metres of potable water piping
- Laid 11,000 metres of underground electrical ducting
- Completed about half a year's work of Hong Kong's traditional road and drainage projects within 10 days at the underground project
Precise delivery — Completion of permanent quarantine and treatment facilities

The two projects in the second batch are permanent buildings located at Penny's Bay and Kai Tak. In line with the concept of Design for Manufacturing and Assembly (DfMA), the two facilities were constructed using the Modular Integrated Construction (MiC) - prefabricated modules are completed with finishes in the factory, including the installation of windows, electric switches, walls, ceilings, raised platforms, etc., and each unit has a private toilet and bathroom. They are then transported and assembled at the site where they are connected with water, electricity and sewage systems. The technology shortened construction period while ensuring high-standard buildings.

Benefits of DfMA:

- Reduce 60% of on-site workers
- Save 30% of costs throughout the project life cycle
- Reduce 50% of carbon emissions
- Shorten on-site construction period by 50%
- Save 25% of materials

The two projects cover a total floor area of approximately 386,000 square metres providing approximately 20,000 quarantine beds.
Either project is composed of different sections given their large scale, each equipped with self-contained water and power supply, medical facilities, office, and storage space, they are delivered in phases. The projects are designed in line with infection control standards and requirements issued by the World Health Organization and those for quarantine centres in Hong Kong in the separation of clean and dirty areas, drainage, sewage, exhaust, etc. In addition, two facilities were designed, constructed, and accepted in strict accordance with Hong Kong’s permanent building standards. The 45-hectare Community Isolation Facility in Penny’s Bay is the largest of all projects. It comprises of six two-storey buildings, providing a total of about 7,000 units. Whereas the Community Isolation Facility in Kai Tak consists of four-storey buildings equipped with lifts and provides nearly 3,000 units.
Community Isolation Facility in Kai Tak

There are 54 lifts in this project. Generally speaking, it takes at least six months for lifts to be delivered and installed after placing an order. However, CSHK managed to shorten the period and complete the project within four months.

- Adopt BIM to design 3D components of prefabricated modules: exchange data under the combine the global concept of openBIM, to visualize the complex prefabricated steel structure in a three-dimensional manner, enabling engineers to accurately know all the data of modules and components during the design.

- Apply the Multi-trade Intergrated MEP technology: the electric control rooms are designed and pre-fabricated in the factory, which accounts for 95% of construction work, greatly shortening the construction schedule.

Scan the QR code for a video on the installation of the first concrete and steel structure DfMA lift shaft in Hong Kong.
Application of innovative technology and construction technology

The application of innovative technology and construction technology was critical for CSHK to complete eight Community Isolation Facilities very quickly, especially the projects in Penny's Bay and Kai Tak. MiC and MiMEP were widely applied by the engineering teams. First, prefabricated components or assembled components are produced in the factory and then transported to the construction site for installation, which greatly shortens the period of construction. Besides, our inhouse developed C-SYS+ Enterprise Management Data Platform and C-SMART Smart Site Platform were leveraged to improve personnel management, mechanical equipment management, material management, safety management, environment, and energy management, construction measurement management and production schedule management. Examples of the application of innovative technology and construction technology in Community Isolation Facilities are as follows.
Integrated logistics management

- Leverage C-SMART and the intelligent logistics management system and build eight transportation nodes, to manage the transportation and installation of over 17,000 MiC modules, and successfully arrange the logistics between the Mainland and Hong Kong.

- Managers can accurately understand the process of MiC components because such information as the real-time location, transportation status, and installation schedules are combined on the C-SMART.

- Use CCTV monitoring, UAV real-time patrol, and AI-based license plate recognition system to achieve on-demand production, accurate scheduling, and intelligent one-in-all transportation control.

Construction schedule management

The real-time visualisation system integrates the daily data on the construction process and BIM model, and visually manages the construction schedule of MiC assembly and all underground facilities on the platform. The system stores massive data such as the type, size, location, estimated installation time, and daily updates of all components. This system helps the management team understand the project progress, evaluate any lags behind the construction plan, flexibly allocate resources available, and make timely and accurate decisions.

- Real time information and data
- Construction period shortened by 60%
- Improved delivery efficiency
Using UAV tilt photogrammetry technology, BIM, and GIS to provide centimetre-level high-precision live models in horizontal and vertical directions can helpfully provide accurate information on the progress of the project.

Five safety monitoring systems are adopted at the site to figure out the trends in key areas in real-time and improve on-site safety management:

- Real-time CCTV monitoring
- AI-based monitoring of unsafe behavior
- Closed area management
- AR live mapping “Eagle Eye”
- UAV real-time safety monitoring system
Employee Health Protection and Care

Project construction took place amid the fifth wave of COVID-19, whereas the sites were densely populated, and the project teams needed to contact and communicate with different people. In order to strengthen infection prevention and safeguard people’s health, CSHK sent an expert group on pandemic prevention to conduct onsite pandemic prevention and rectification work and put multiple measures in place: assigning local pandemic prevention director to implement the responsibility of pandemic prevention and control, establishing health declaration platform, and installing air purifier with HEPA and oxygen polymerization for air treatment and spray disinfection nanocoating in office areas.

To advance the project in full swing, 24 hours shift rotating program was established for eight projects on site. Meanwhile, in a bid to ensure the onsite staff has access to sufficient guarantees and support, we continuously distributed protective masks and quick test kits to staff and fellow workers. In addition, we have established a sound incentive mechanism to provide staff with a variety of timely benefits according to the actual situation of the project, covering transportation allowance, epidemic prevention allowance, and allowance for people in the infected area.

CSHK also cares for onsite people in a comprehensive manner by setting up happiness stations onsite to provide service for all. The happiness station is equipped with health and leisure facilities and first aid supplies. It provides onsite staff and fellow workers with not only three meals a day, afternoon tea, and night snacks but also health consulting services, making them feel the care and attention of the company.

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2.6 million + meals were provided

1.4 million + medical masks distributed

880,000+ quick test kits distributed during the pandemic
Working together with one heart to fight against the pandemic

All sectors of society united as one in the fight against the fifth wave of the pandemic. CSHK was honoured to contribute our efforts to pandemic control for Hong Kong with the contributions of the construction industry in tough times. At our company, our employees at all levels of the company raised to the challenge and actively participated in building Community Isolation Facilities and quarantine centres, striving for the protection of more than seven million local people’s health.

“As the fifth wave of COVID-19 hit Hong Kong, President Xi Jinping made important instruction of “three all” and “two guarantees” for Hong Kong to fight the pandemic on February 16. With the full support of the Central Government and the HKSAR government, CSHK attached great importance to the instruction and responded quickly. At the end of February, eight Community Isolation Facilities aided by the Central Government started at the same time, and the overall delivery was completed in only 122 days. CSHK raced against time and created an architectural miracle. The construction team was “reliable, flexible, passionate, and capable” at any time. The construction of this anti-epidemic project has demonstrated to the world “a certain strength in an uncertain world”, and contributed to the strength of China State Construction Engineering during the flight in Hong Kong.”

Mr. HUANG Jiang
Executive Vice President of CSHK
"With the strong support of the Central Government and the Group, the company regards the construction of pandemic prevention projects as the number one project, and upholds the responsibility of "well-built, well-used, well-managed", and the construction of six mobile cabin hospitals started at the same time. We raced against time, worked day and night, and we completed all six mobile cabin hospitals within a month, and completed two permanent Community Isolation Facilities within four months.

Behind this "Hong Kong miracle" and "China's speed" are not only the concerted efforts of all sectors of society and the hard work of the company's construction personnel, but also the great demonstration of the advantages of the "one country, two systems", this force will surely lead Hong Kong out of the pandemic situation and bring the city a new life."

Mr. ZHANG Ming
Vice President

"Community quarantine facilities aided by the Central Government kicked off in the face of the fifth wave of COVID-19 in Hong Kong. To win the battle against the invisible coronavirus enemy, all our colleagues were committed to striving to overcome any and all challenges and obstacles to deliver the projects. Also, the victory owed as much to CSHK's strategic efforts and technological strengths accumulated along the way.

Based on DfMA (Design for Manufacture and Assembly), a modular design concept, CSHK drew on MiC (Modular Integrated Construction) to enable fast construction. The C-SMART Smart Site Platform was also used for logistics tracking, progress planning, quality management, and safety supervision to ensure high-quality delivery ahead of schedule. The practices marked one step forward to empowering construction with technology."

Mr. SHAO Ruizhe
Assistant President
"As Hong Kong fell short of quarantine and treatment facilities in the face of the severe pandemic outbreak, Community Isolation Facilities were urgently needed. Under the tight schedule, we leveraged our experience in the successful construction of makeshift hospitals to save time for construction. Our in-house developed C-SYS+ Enterprise Management Data Platform and C-SMART Smart Site Platform were adopted to improve manpower management, machinery and equipment management, materials management, safety management, environmental and energy management, construction measurement management and production progress management. To speed up the installment of lifts in the Community Isolation Facility in Kai Tak, the engineering team made painstaking efforts and finished the inspection of drawings, development of plans, and application of BIM in just a few days, effectively shortening the construction period. CSHK united as one and put multi-pronged efforts into the construction of Community Isolation Facilities, creating a miracle in Hong Kong’s construction industry."

Mr. ZHANG Yi  
Assistant President and Chief Designer of Isolation Facilities of CSHK

"Rooted in Hong Kong, CSHK shouldered our responsibility to spare no effort to the construction of projects on epidemic prevention against the backdrop of outbreaks of the pandemic. As the project manager of the Yuen Long Community Isolation Facility, I participated in the decision-making of the project from all stages of the project including project planning, design, duration, and resource allocation. During the construction, we were very proud that our project team had overcome difficulties unseen before including a shortage of workers, the impact of the pandemic on the supply chain, and the short construction duration."

Mr. ZHANG Baoping  
Chief Commander of Community Isolation Facility in Yuen Long
"The mission of the Central Government's aid to Hong Kong is an unforgettable life experience. Looking back at the beginning of the project, we faced a situation where construction, design and coordination had to be started everywhere. Many staff members left their ongoing projects and came to support us, others even felt sorry for not being able to join us. The Kai Tak project is designed to be used for 50 years, and has high demand on engineering quality. We need to work together to achieve the goal. With the concept of "transcending ourselves and breaking through the limit", we finally made the impossible task possible."

**Mr. LIU Baoqing**
Commander of Community Isolation Facility in Kai Tak

"CSHK participation in fighting against the pandemic again comes at a critical juncture when the fifth wave of the outbreak in Hong Kong is extremely severe. We understood that the only way to protect the life and health of local residents is to complete the Community Isolation Facility as soon as possible. In addition, considering the post-pandemic usage of facilities, we adopted permanent building design standards for Community Isolation Facility in Kai Tak. The facilities will be changed to transitional housing, striving for the housing issues in Hong Kong after the pandemic."

**Mr. SHI Da**
Project Manager of Community Isolation Facility in Kai Tak (Site B) – Site Formation, Mud Well and Drainage Works
"I joined CSHK upon graduation and have participated in quite a few large-scale projects. I'm proud to be involved in this and contribute my effort to society. Participating in the facility construction for pandemic prevention broadened my vision and made me full of confidence in the working environment in the construction industry and my career development in the company. For example, we have adopted different technologies including MiC and C-SMART to reduce construction period and improve productivity.

Bringing back to February 2022, as the first batch of staff participated in the Community Isolation Facility project, we even have not been hindered by the bad weather and environment there. Especially at the initial stage of the project, we need to quickly find solutions and make optimal decisions in the face of multiple difficulties and sudden situations. I believe that this experience will lay a good foundation for my future work to tackle the challenge calmly."

**Mr. NG Hoi Chung**
Senior Engineer of Community Isolation Facility in Kai Tak
Promoting Sustainability
Over the past four decades, CSHK has always been committed to fulfilling our corporate social responsibility. Dedicated to incorporating the concept of sustainability into our business development, we have established a clear sustainability governance structure and have been continuously improving and implementing our sustainability policies and measures. Aiming at creating sustainable, impactful value for stakeholders, we fully consider the interests and opinions of stakeholders during decision-making, thus working towards the vision we share with stakeholders.
CSHK has established a sustainability governance structure consisting of a Sustainability Committee, a Sustainability Report Writing Committee, and a Sustainability Affairs Working Group. The structure ensures that sustainability-related concepts and guidelines are implemented in an orderly manner, integrating into our corporate culture and business operations, and continuously contributing to our sustainable development.

**Sustainability Committee**

CSHK’s Chairman and President acting as the chairman

**Responsibilities:**
- Develop and review the sustainability roadmap
- Formulate and supervise sustainable development policies
- Review and approve other sustainability initiatives

**Sustainability Report Writing Committee**

CSHK’s Chairman and President acting as the chairman

**Responsibilities:**
- Coordinate works related to the sustainability roadmap
- Coordinate the development of sustainability policies
- Coordinate data collection and related work for sustainability reports
- Review sustainability reports

**Sustainability Affairs Working Group**

General Manager of the Corporate Communications Department acting as the team leader

**Responsibilities:**
- Conduct research related to the sustainability roadmap
- Conduct research related to the formulation of sustainability policies
- Support the coordination of data collection and related work for sustainability reports
- Support in reviewing the content of sustainability reports
- Review and collect information on annual highlights of sustainable development
- Other sustainability work
**Promoting Sustainability**

### Sustainability Strategy

Committed to promoting sustainability, we have based our sustainability strategy on three core dimensions, namely on “Building Consensus”, “Promoting Innovation” and “Creating Value”, which allows us to deal with ever-changing operating environments in a more flexible manner and create long-term value for stakeholders in a consistent manner. As we gather consensus and innovative minds, we honour our commitment to building a better world.

<table>
<thead>
<tr>
<th>Sustainability Strategy</th>
<th>Background and Ideas</th>
<th>Commitment to Global Goals</th>
<th>Our Actions</th>
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</table>
| **Building Consensus**  | A city means more than just buildings and infrastructure. It is also a common achievement of various stakeholders over the years to create a more ideal living environment. Urban planning and architectural proposals must consider factors of the local environment, society and economy. The government, society, enterprises and other participants must work together sincerely to reflect upon our ways of building, managing and living in the city, so as to gain mutual understanding in promoting the healthy development of a city. We understand that stakeholders may be at different stages in the pursuit of sustainable development. This includes the differences in understanding, commitment and coping abilities in terms of aspects such as ecological conservation, climate change and residents’ health. As a main contractor, while we assist in the construction of cities, we also take on the responsibility of fostering consensus of sustainability from all walks of life. We proactively communicate, coordinate and learn to build a collaborative platform of mutual trust with stakeholders. Through these efforts, we aim to work together with all stakeholders to build a better living and working environment for the society. | ![Commitment to Global Goals] | - Conducted a comprehensive stakeholder survey during the Reporting Period to understand stakeholders’ opinions on CSHK’s sustainability work
- Provided employees with diversified development opportunities, competitive remuneration and benefits package, and comprehensive health and safety protection
- Maintained close cooperation with suppliers, sub-contractors and other stakeholders in the value chain, in which they are required to comply with CSHK’s requirements on environmental and social aspects, thereby promoting the sustainable development of the industry as a whole |
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<tr>
<td>Promoting Innovation</td>
<td>The Construction industry has a long history and a pursuit of sophisticated techniques and crafts. Technological innovation has always been one of the most crucial factors for technical development. As the global social structure is changing and information technology is developing rapidly, the traditional image of the dusty and crowded construction site is now gradually transforming towards the direction of the implementation of AI technology on construction sites. The widespread adoption of new technology has brought unprecedented changes to the construction industry. Over the years, CSHK has persistently invested in the development of smart sites, guiding employees and business partners into Construction 2.0. Throughout the process of innovation, we emphasise the combination of construction experience and technological breakthroughs to incorporate knowledge from different fields. We promote technology, such as MiC, BIM and automated production, to enhance speed, volume and efficiency, and efficiently utilise them throughout the life cycle of construction projects, thereby realising the value brought by technology.</td>
<td>Commitment to Global Goals</td>
<td>• Promoted digital transformation, developed enterprise-level data platform C-SYS+, and set up C-SMART Smart Site R&amp;D Centre during the Reporting Period • Developed MiC buildings and used MiC to build Emergency Isolation Facilities in Kai Tak Cruise Terminal and Penny’s Bay • Promote on-site and off-site automated production, fit into one-step production chain solutions • Strengthened BIM-related personnel training and project application to achieve “BIM for all”</td>
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<td>Creating Value</td>
<td>Corporate social responsibility has been defined in different ways in different eras. As social thinking changes, the public’s expectation of a company has changed as well. Traditionally, a company is expected to make profits to satisfy its investors. Nowadays, besides making profits, a company is also expected to manage its impacts on the society and the environment, and some even act and formulate strategies with reference to the United Nation’s Sustainable Development Goals (SDGs), so as to cope with the global challenges together with other members of the society. CSHK has been seeking a business model that can both achieve business profits and safeguard society’s interests, in order to grasp the opportunities brought by sustainability, meet various challenges, and provide solutions for local social and environmental problems based on our expertise, so as to create shared value.</td>
<td>3. Good Health and Well-being</td>
<td>• Participated actively in charitable and volunteer activities to respond to the demands of the community</td>
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<td>4. Quality Education</td>
<td>• Provided diverse learning opportunities for grassroots children and young people</td>
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<td>11. Sustainable Cities and Communities</td>
<td>• Implemented the “Thousands of Homes for Maintenance” Scheme to provide a variety of volunteer services of home repair to residents in need</td>
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</table>
CSCI established its own sustainability roadmap during the Reporting Period, which includes goals and action plans in five focus areas. As a member of CSCI, we have committed ourselves to the following initiatives during the Reporting Period in line with the five focus areas.

**Vision**
Developing into a world-class and sustainable corporation with international construction and infrastructure investment

**Mission**
Leading a trend of innovation, building a life of happiness

## Five Focus Areas

1. **Safeguarding the Environment**
   Environmental issues such as the proper management of the environmental impact of construction work have always been important issues for the industry, and have become even more important in the context of climate change leading to frequent extreme weather and the transition to a low-carbon economy.

2. **Building a Sustainable Supply**
   This industry involves multiple processes and partners such as raw material suppliers, so achieving sustainability requires a concerted effort from all parties.

3. **Nurturing and Supporting Talent**
   Human resources are the foundation of corporate development. The Group attaches great importance to the recruitment and cultivation of talents to ensure that it is always leading in the industry and stays world class.

4. **Serving the Community**
   Given that construction and infrastructure projects are inextricably linked to social development, the Group fulfils its corporate social responsibility in active ways to improve people’s livelihood and contribute to the communities where it operates.

5. **Leading with Innovation**
   Developing and utilising construction technologies to create differentiation and enhance the Group’s core competencies by leading innovation and deployment along the industry chain.

During the Reporting Period, we continued to review our sustainability strategy and performance. Efforts were made to develop our own sustainability roadmap and establish our sustainability path. By doing so, we have made a positive impact and created value for society while achieving steady business growth.
Engaging with Stakeholders

CSHK is deeply aware of the importance of maintaining close communication with various stakeholders to our sustainability progress. Therefore, we have been committed to maintaining an open dialogue and building mutual trust with its stakeholders by establishing regular and diversified stakeholder communication channels, including regular meetings, events, reports, websites, among others. To drive our sustainability progress, we gathered the views, opinions, and expectations of various stakeholder groups across the value chain, thereby identifying sustainability issues of their concern and areas we need to improve.

Stakeholder Engagement

In order to gain a more comprehensive understanding of stakeholders’ views, opinions, and expectations on CSHK’s sustainability work, we carried out stakeholder engagement in various formats in 2021, including online surveys, focus group discussions, and interviews. These stakeholder engagement efforts provided us with an in-depth understanding of the opinions of key internal and external stakeholders, including management, employees, suppliers, sub-contractors, owners, representatives from industry associations and social welfare organisations.

During the Reporting Period, to understand the views and suggestions of a wide range of stakeholders on the sustainability performances of the construction industry and CSHK, we prepared an online survey for stakeholders to rank each identified sustainability issue by priority. Meanwhile, we invited stakeholders to rate CSHK’s performance on various sustainability issues and suggest relevant improvements in the survey. These efforts helped us to review and plan our sustainability strategy and effectively respond to the expectations of stakeholders.
Materiality Assessment

We conducted a materiality assessment based on the following steps to determine the sustainability issues that would have a higher level of impact on CSHK and our stakeholders.

**Step 1:** Identifying sustainability issues
- Identified 14 sustainability issues according to international and local sustainability reporting standards such as the Global Reporting Initiative Standards (GRI Standards), United Nations Sustainable Development Goals (UNSDGs), United Nations Global Impact (UN Global Compact), etc. and based on the actual situation of the construction industry and CSHK.

**Step 2:** Prioritising Sustainability Issues
- Invited internal and external stakeholders to participate in the online survey to take rank with the importance of each sustainability issue.
- Analysed the survey results based on the dimensions of “impact on CSHK’s businesses” and “impact on stakeholders” and identified CSHK’s material issues in 2021.

**Step 3:** Validating the Results of the Survey
- Discussed the results of the materiality assessment with senior management to confirm the material issues.
The following materiality matrix was developed based on the stakeholder engagement survey results. We identified six issues with a higher level of impact on CSHK and stakeholders.

**2021 CSHK Materiality Matrix**

### Employment Relations and Management
1. Dealing with labour shortage
2. Promoting talent development in the industry

### Workplace Safety and Culture
3. Establishing a safety culture at work

### Environmental Protection
4. Environmental impact of projects and control measures
5. Sustainable construction and building lifecycle
6. Climate change related risks and opportunities
7. Sustainable resource management and consumption
8. Exploring carbon neutrality during construction phase
9. Green supply chain management

### Value Chain Collaboration
10. Technological innovation
11. Promoting value chain collaboration
12. Protecting customer and business data
13. Product quality and safety
14. Paying attention to social welfare
Promoting Innovation
With meteoric advances in technology, it has become a trend for Hong Kong's construction industry to embrace innovative technology. Through the development and utilisation of innovative construction technologies, CSHK is committed to enhancing our core competitiveness while ensuring construction quality, safety and environmental benefits, turning sustainability challenges into opportunities and further supporting the digital and automated transformation of the industry.
New Mindset for New Technology

With our roots entrenched in Hong Kong for more than 40 years, CSHK specialises in constructing high-quality and technical works. We have been involved in massive large-scale government infrastructure projects, public housing, private residential buildings, and industrial and commercial projects. As an industry leader in promoting technological innovation, we develop and widely use innovative construction technologies, such as Modular Integrated Construction (MiC), Building Information Modelling (BIM) technology, Design for Manufacture and Assembly (DfMA), and cloud network technology for digital interactive information communication, in a bid to build a better living and working environment for the society.
Technology Management Structures

CSHK has set up a Technology Working Group led by Mr. HUNG Cheung Shew, Chairman and President of the Company. The working group is responsible for reviewing development plans in smart management, examining the technology management system as well as the applicability and efficacy of innovative products and technologies, and supervising the technology work of each business segment. A technology management structure has been established in all construction entities to incorporate technology management throughout the Company and better promote innovative technology. In addition, we commend and reward teams that have made outstanding achievements in technology work, such as innovation, promotion, and introduction of technology, aiming at engaging all subsidiaries, departments, and site offices in such efforts.

Application of BIM Technology

For years CSHK has been aggressively pushing for the wide application of BIM technology in major projects. In the process of architectural planning, design, and construction, we use 3D modelling and simulation software to digitise the data of building geometry and components, accurately display the building structure and simulate the construction. This technology helps the engineering team discover and address potential problems at the beginning of the project and improves construction efficiency and quality. When performing projects, our BIM team establishes a three-dimensional to seven-dimensional building information model based on BIM technology for site plan management, schedule management, project completion and inspection, and calculating the magnitude of construction. In addition, we integrate BIM technology into the supply chain. In addition, we drive the supply chain through BIM. With the use of the BIM database and QR code technology, we improve the efficiency and accuracy of the production of prefabricated parts, monitor the production process of the components with better efficiency, and ensure the progress of the project.
Based on the BIM Standard issued by the Construction Industry Council, CSHK has formulated and strictly implemented the CSHK BIM Standard on the new construction site. In collaboration with many institutions of higher education and BIM software vendors in Hong Kong, Macao and Mainland China, we provide full support for their digitalisation of construction information and management data.

CSHK continues to research and develop new BIM technologies, extending its use to construction, operation, and maintenance stages apart from design.

As of the end of the Reporting Period, BIM technology had been applied to 47 projects comprehensively.

3D Laser Scanning Technology

3D laser scanning technology can capture a maximum of 1 million points per second to measure objects at a 360-degree angle, besides visualising the data. On such a basis, we use the scan-to-BIM scanner to scan and model the conditions at the construction sites and compare them with the BIM model to check any structural and dimensional deviation. This application can quickly unveil whether the actual construction is consistent with the design, which makes BIM design more accurate. Corrective actions are timely taken to improve the construction efficiency and lower the cost. In addition, scanning after the completion can effectively and accurately collect data for repair and maintenance.

We also combine BIM technology with virtual reality (VR) technology to visualise the 3D design. Apart from increasing construction efficiency, the combined technology can simulate the completion status of the project where owners and users have access to the immersive environment. Further, we adopt the artificial reality (AR) technology to help compare the reality at the construction site with the BIM model to ensure smooth construction.
As BIM operation continues to mature, inspired by the goal of "BIM for All", CSHK sets up a BIM talent team to cater to the rising demand for this technology in the construction industry in recent years. In 2020, CSHK BIM Centre was established as a site to test BIM related new technology and new process and held regular meetings, workshops, and information sharing.

We expect that 80% of employees from CSHK’s Engineering and Surveying Estimation Department will be trained in BIM in the coming two years, so as to achieve “BIM for All”

Through in-house training and promotion, we strengthen the training of management and engineering staff at all levels and train them on targeted fields. The BIM technical training is designed to match employees’ qualifications and fields of specialisation, including how to model and host meetings on BIM software or how to use model data to survey and estimate project costs.

Employees who complete Training Phase II with a certificate will receive a HKD $6,000 bonus, and the top five employees picked as BIM Stars will receive a HKD $20,000 bonus. To continue the training programme during COVID-19 outbreaks, we launched online BIM training to speed up Phase II for employees, so that they can seamlessly apply BIM to their daily work.
Modular Integrated Construction (MiC)

Known as “Prefab 4.0”, MiC is an innovative construction method based on the concept of DfMA. Adopting the concept of “factory assembly followed by on-site installation”, free-standing integrated modules (completed with finishes, fixtures and fittings) are manufactured in a prefabrication factory and then transported to sites for installation in a building, so as to shorten the on-site construction time and reduce the demand for manpower at construction sites, thereby enhancing productivity and quality.

Driven by the market, CSHK has been putting great effort into developing prefabricated buildings since the 1990s. When the technology advances over time, we have further explored innovation - from the use of prefabricated components, such as prefabricated facades and prefabricated staircases at the beginning, to the industry-leading development and application of MiC technology. We integrate VR, AR, BIM, and C-SMART technologies in the MiC project, which directly embeds electrical and mechanical devices, pipelines, built-in decoration, and other elements into the MiC unit components at the stage of design. This integration enables an early look at the final design, producing a more accurate construction.
Benefits of MiC

<table>
<thead>
<tr>
<th>Improve environmental performances</th>
<th>Improve cost-efficiency</th>
<th>Improve engineering quality</th>
<th>Improve working environment and site safety</th>
</tr>
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<tbody>
<tr>
<td>Reduce the wastage of materials as fewer and lighter materials are required</td>
<td>Save total project construction time by about 30% on average</td>
<td>Improve construction accuracy by producing modules in the controlled factory environment</td>
<td>Improve safety at construction sites, reduce the risk of workers falling from height and the risk of workers slipping and tripping</td>
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<td>Streamline on-site procedures to reduce construction wastes</td>
<td>Shorten the production period by constructing different modules in parallel in the factory</td>
<td>Facilitate quality control through carrying out pre-testing of prototype modules before mass production</td>
<td>Reduce the impact of weather on constructions and protect workers against adverse weather</td>
</tr>
<tr>
<td>Reduce dust and noise nuisance to the surrounding environment during construction</td>
<td>Increase management effectiveness, so as to minimise management the cost of site management</td>
<td>Minimise errors in construction</td>
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<tr>
<td>Save wood by 80% than traditional building methods; reduce noise and construction wastes by 80%; save water by 60%; save manpower by 50%</td>
<td>Modules can be reused and rebuilt in other construction sites after disassembling to achieve asset preservation</td>
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Drawing on the MiC technology, we have completed projects such as the Quarantine Centre at Lei Yue Mun Park & Holiday Village, the Quarantine Centre at Penny’s Bay, the Hong Kong Inflection Control Centre (HKICC) and “Fangcang” at HK Expo, and Community Isolation Facilities in Penny’s Bay and Kai Tak. We continue to explore the application of MiC technology in different construction projects.
Relocation of Sha Tin Sewage Treatment Works to Caverns

The Relocation of Sha Tin Sewage Treatment Works to Caverns project is currently the largest cave development project in Hong Kong. The relocation programme proceeds in three phases and the cave construction in the second phase is expected to be completed in 2027. Due to the proximity of the site to residential buildings, we have made use of innovative technology to improve the efficiency and minimise the impact on nearby residents. MiC technology plays a part in the construction of the Community Liaison Centre. The components were transported to the site after being prefabricated in the plant. It only took two days to assemble the structures, which greatly shortened on-site construction time.

Chinese Medicine Hospital and Government Chinese Medicines Testing Institute

The Chinese Medicine Hospital and the Government Chinese Medicines Testing Institute project covers an area of about 60,000 square metres, with a floor space of about 190,000 square metres. Commenced in June 2012, the project was carried out in the model of "Design + Build" relying primarily on traditional construction techniques as well as the MiC technology. 20% of the building was made up with more than 2,000 MiC prefabricated components. The C-SMART system was adopted for the entire construction process. Intelligent monitoring, visual management, information-based management, and digital management were widely applied to effectively enhance project management.
Research and Application of Key Construction Technology

CSHK places great emphasis on technology research and development, and timely applies for patents for new techniques, technologies, and research. In terms of the research and application of key construction technologies, the immersed tube tunnel design and construction technology have been successfully practiced in building the immersed tunnels of Shatin to Central Link and Shenzhen-Zhongshan Bridge. The construction technology has secured a series of awards, including the first prize of the Science and Technology Award 2021 of China State Construction, the NCE Tunnelling Project of the Year 2020 of the Institution of Civil Engineers (ICE), the CIC Sustainable Construction Award 2020, MTR Gold Safety Award, MTR Gold Environmental Award, MTR Gold Quality Award, and MTR Gold Community Care Award. Those honours demonstrate our strength and competitiveness in tunnel engineering.

### Research and Application of Immersed Tube Tunnel Design and Construction Technology

<table>
<thead>
<tr>
<th><strong>Background</strong></th>
<th>The 1.7-kilometre Shatin to Central Link — Cross Harbour Tunnel is constructed as an immersed tube tunnel. It requires 120 years of design life, a 4-hour fire rated protection, and a resistance to magnitude 7 earthquake</th>
</tr>
</thead>
</table>
| **Challenges** | • Face technical challenges such as how to install the immersed tube with high durability, earthquake resistance, and high precision or how to lay the foundation  
• Tackle problems including how to build the special terminal joint and how to deal with a busy tunnel where water velocity is over 2.0 metres per second |
| **Achievement** | The Shatin to Central Link — Cross Harbour Tunnel project was completed 282 days ahead of schedule. Its construction saved 6,021 tonnes of steel, 30,000 square metres of wood, and 1,000 cubic metres of concrete, reducing nearly 80,000 cubic metres of mud to be backfilled and dumped. The technology reduced the impact on the navigation of Victoria Harbour and the surrounding environment of both banks |
**Design-Build-Operate (DBO) Model**

Apart from the constant technological innovation, CSHK seeks to optimise the contracting model. Under the DBO model, we provide comprehensive services in exhaustive design, building, and operation so that the more cost-effective project has a larger canvas to embrace innovative technologies and prompt a more efficient implementation of the project plan.

Compared with traditional models to implement projects, the DBO model improves the quality of design and construction, saves costs, shortens the construction cycle, enhances the operation and management, and increases the anti-risk ability, which contributes to the overall project progress and operation. Also, for the industry, this new model facilitates the use of advanced practical technology and management experience and spurs better industry-wide technology and operation management.

**O-PARK2**

O-PARK2 is the first DBO project we operated. Its design and construction take 33 months and the operation will last for 15 years. The DBO model plus several new digital technologies help the costs to cut during the whole lifecycle of the facilities and contributes to the sustainable development of the project.

**Tseung Kwan O Desalination Plant**

The operation of the Tseung Kwan O Desalination Plant lasts 15 years. Closely following the DBO contract, the project team proactively engages in internal communication and coordination with joint operators and enhances the quality of preliminary design and construction. Those actions include the design and construction of more than a dozen buildings and electromechanical equipment projects such as seawater reverse osmosis desalination components, immersed tube, and drainage pipelines, pre-treatment buildings, and reverse osmosis buildings and administrative buildings. The team also strives to reduce the operation and maintenance costs.
Facilitating Intelligent Transformation with Leading Technology

With exponential technological progress, digital transformation has become a trend for the construction sector. Over the years, the Hong Kong government has proactively promoted “Construction 2.0” and “Reindustrialisation” to encourage the application of innovative technologies. We have also made constant efforts to improve our digital capability when expanding our business. We continue the futuristic digital transformation and introduce an information-based management system to boost productivity, improve the quality of construction, build safer construction sites and increase environmental benefits through innovative technology. Our ultimate aim is to address the multiple challenges facing the construction industry, such as the aging workforce, higher construction costs, and potential safety issues at the construction sites.

What is C-SYS+?

To satisfy our business needs, CSHK has developed different digital management platforms since more than 10 years ago. Today, as we uphold comprehensive digital transformation as our goal, we have been advancing the C-SYS+ system for digitisation upgrades. C-SYS+ integrates more than 30 digital management platforms of CSHK. It serves as the backbone of data transmission, effectively combining, integrating, and utilising data and resources on these platforms. It also provides timely and accurate data and information to support the decision-making of the management.
C-SYS+ Enterprise Management Data Platform

CSHK has indigenously developed the C-SYS+ system, an enterprise management data platform. We are committed to information-based advancement. We bring in sophisticated innovative technologies across the company and for all projects, helping to enhance the level of business management and corporate governance.

The C-SYS+ system includes combined innovative technologies such as data collection and analysis, AI-based date comparison and prediction, and robot development. Focusing on safety, quality, human resources, and financial management, it digitalises and dynamically manages the full process of the project. The C-SYS+ system collects and sorts out internal and external data in a timely and accurate manner, which helps control core businesses through online systems and improve efficiency.

The C-SYS+ system has been extensively used in CSHK’s businesses and project operations. In terms of business management and control, the system can analyse material and machinery prices, friction loss, and other data over the past 10 years, which helps to formulate bidding and pricing strategies. CSCHK has also developed the CDMS4.0 project dynamic management system for life-cycle management of materials, thereby improving the management of project materials and costs.
As to site management, C-SYS+ is an all-in-one platform of construction data. It provides accurate information on project progress as well as safety, environmental, and quality indicators, enabling flexible allocation of resources. The system also provides a communication channel that links CHSK with upstream and downstream partners to create synergies. For example, we can connect with project owners via the file management software of C-SYS+, or connect with the Procurement Department, the sites, and suppliers with the Concrete Smart Management Platform. These tools greatly reduce communication costs and misinformation.

In addition, the ESG and Sustainability system uses the online carbon neutral big data platform to see how effective the project’s carbon emissions and carbon reduction measures are, and further review decisions about sustainable development.

Faced with ever-changing challenges in the current society, CSHK has been enriching the functionality of C-SYS+, such as adding an urban map system that presents the development potential and risk factors of each area. It allows us to better grasp tendering opportunities in the market, enhance risk management, and improve project planning. We will continue to optimise the C-SYS+ system and create various platforms to lead the digital transformation of the industry.

“Smart Site Integrated Management Solution”
CSHK aspires to independently develop and upgrade cutting-edge technologies. In this way, we proactively integrate the IoT, cloud analysis, AI, and other technologies into the construction project management for intelligent, digital and information-based management at the construction site. To effectively improve the efficiency of project construction management and strengthen quality control, CSHK built an integrated building technology information management platform "Smart Site" in 2020. During the Reporting Period, CSHK named the platform "Smart Site" as C-SMART, which stiffened our resolve to launch innovative technologies and promote smart buildings.
The C-SMART platform incorporates IoT, AI, cloud computing, and other technologies into the construction project management. Thus, the platform collects, summarises, and analyses the site information to facilitate the construction management and decisions, and systematically comprehensively manages and supervises the personnel, safety and environmental protection, schedule, resources, construction quality and other aspects of the construction project, so as to achieve the following objectives:

- Save manpower from dull repetitive work and increase productivity
- Reduce the number of workers engaged in dangerous work or entering the dangerous area, protecting their health and safety
- Optimise process management and improve overall efficiency
- Provide project managers and other stakeholders with a more transparent and accurate information whenever and wherever possible

### Personnel management
- Face recognition-based attendance system
- Real-time monitoring of workers and construction sites
- Automatic registration system
- Electronic health form

### Mechanical equipment management
- Mobile monitoring of machinery at construction sites
- Scale operation efficiency
- Operating efficiency of material hoist

### Material management
- Remote monitoring of prefabricated components
- Monitoring of license plate at the entrance and exit of the construction site

### Construction environment and energy consumption management
- Environment, gas and water quality intelligent monitoring system
- Smart electric box AMPD
- AMPD mobile power storage

### Security management
- Monitoring of workers' unsafe practice AI
- AI-based fire monitoring system
- Safe driving management
- VR-assisted real scene safety training
- Digital Twin real-time monitoring

### Construction survey management
- Tower crane counted imaging camera measuring and monitoring system
- 3D laser scanning
- Smart monitoring system of building settlement

### Quality management
- Project progress and quality management system

### Building robots
- AMR robot (under development)

### Schedule management
- UAV aerial imaging and mapping and construction progress
- BIM visualization of construction progress

### Integrated platform
- 7+2+1 BIM
Real-time monitoring of site work by workers
Mobile machinery monitoring at construction sites
Materials management
Visualisation of quality management system
Monitoring of unsafe practice
Construction environment and energy consumption management
UAV aerial imaging and mapping construction progress
Visualisation of construction progress
Scan the QR code for more information about C-SMART Smart Site Platform.

Brochure:

Video:
On 21 September 2021, CSHK held the grand opening of the C-SMART Smart Site R&D Centre in Hong Kong Science and Technology Park.

Hong Kong Palace Museum widely uses BIM technology at all stages of project design, construction, and operation. On top of that, the project also adopts C-SMART to collect all project information by means of IoT and AI technologies, so the engineering team can immediately stay aware of the project situation.

As of the end of the Reporting Period, the CSHK C-SMART Smart Site R&D Centre handled 20 exchange activities.

Mr. WANG Yong, senior site manager of the Hong Kong Palace Museum project, shared the benefits about innovative construction technology and Smart Site bringing along with the project. Scan the QR code to watch the interview.

On 21 September 2021, CSHK held the grand opening of the C-SMART Smart Site R&D Centre in Hong Kong Science and Technology Park.
CSHK organises technical exchanges and promotions for employees and the public from time to time to enhance their awareness of frontier technology trends and the application of such technologies.

In June 2021, a smart construction site workshop was held at the site of the Hong Kong Palace Museum project for technical exchange.

In October 2021, CSHK's in-house developed C-SMART platform was showcased at a Remarkable Construction themed exhibition held at the Hong Kong Convention and Exhibition Centre.
Green Construction for Low-Carbon Communities

As a major construction contractor, CSHK places consistent importance on the environmental management of construction projects, prompting a coordinated effort to minimise the environmental impact of construction projects. Following internationally recognised guidelines on environmental and energy management, CSHK has formulated the Environmental Policy and Energy Policy to set out our environmental commitments.

**Our Commitments**

<table>
<thead>
<tr>
<th>Environmental Policy</th>
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<tbody>
<tr>
<td>• Comply with statutory, contractual, and other requirements</td>
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<tr>
<td>• Prevent environmental pollution</td>
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<tr>
<td>• Reduce construction waste</td>
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<td>• Minimise the consumption of natural resources</td>
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<table>
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<tr>
<th>Energy Policy</th>
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<tbody>
<tr>
<td>• Comply with statutory, contractual, and other requirements</td>
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<tr>
<td>• Ensure the availability of necessary information and resources to achieve objectives and energy targets</td>
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<tr>
<td>• Support the selection and procurement of energy-efficient products, services and designs that improve energy performance</td>
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Sustainability Special Issue: Community Isolation Facilities

Promoting Sustainability

Promoting Innovation

Building Consensus

Creating Value

Appendix

2021 Sustainability Report
**Environmental Management System**

To handle daily environmental matters in a more effective manner, CSHK established the Safety and Environmental Protection Department, a dedicated department responsible for the implementation of the Environmental Policy and Energy Policy at each project. The Department also assists other departments in environmental works, such as the Human Resources Department, Resource Department, and General Office, and reports regularly to the Integrated Management Committee on its progress.

In addition, an integrated site management working group will be set up at each project according to the project content, which facilitates the implementation and management of site environmental protection work.


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All construction projects of CSHK have obtained **ISO 14001:2015 Environmental Management System Certification**

To realize on our environmental commitments, we have set the following six environmental objectives for all construction projects. In addition, each project has their respective standards to meet, which cover water consumption, electricity consumption, wood consumption, etc. and get heightened each year. At the end of the Reporting Period, we reviewed the performance of each project against the standards. The main reasons why certain projects failed to meet their standards were analysed and countermeasures were formulated for continual improvement.
To further improve construction environment and respond to environmental concerns, we revised the Working Guidelines on Health, Safety, Environmental and Disease Prevention Management (6th Edition) and the Environmental Management Standard Operating Procedures (2nd Edition) during the Reporting Period to set out in detail mitigation measures for environmental aspects that include but are not limited to the following:

| Dust suppression | • Set up wheel washing facilities at vehicular entrances and exits  
|                  | • Large scale application of reusable precast concrete slabs for hard-paved construction  
|                  | • Proper boarding with sprinkler at site boundary  
|                  | • Proper coverage and storage of dusty materials  
|                  | • Use vacuum cleaner and filter for drilling and grinding work and dispose of dust collected properly  
|                  | • Strictly carry out the asbestos abatement plan  
|                  | • Use water spraying trucks, water sprinklers, and mist spraying systems for effective dust suppression at construction sites  
| Wastewater treatment | • Proper treatment of construction wastewater using well-established wastewater treatment system (including wastewater collection channel, pre-sedimentation tank, chemical precipitation and neutralisation facilities)  
|                   | • Recycle wastewater for dust suppression and other use to reduce wastewater discharge and consumption  
| Noise reduction | • Use low-noise low-vibration equipment  
|                 | • Erect noise barriers at strategic locations  
| Waste disposal | • C&D materials segregation at source  
|                | • Reuse excavated material for backfilling on-site  
|                | • Explore alternative C&D material disposal solutions to ease the burden of fill banks  
|                | • Set up food waste treatment equipment  
| Energy conservation | • Use energy-efficient appliances and equipment  
|                  | • Install solar power units  
| Greening | • Set up tree protection zones  
|          | • Planting at into site offices  

Sustainability Special Issue: Community Isolation Facilities  
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2021 Sustainability Report  
China State Construction Engineering (Hong Kong) Limited
The Hong Kong government has been actively expanding land resources to ensure the sustainable development of Hong Kong. Developing cavern facilities is one of the proven methods to make the best use of underground space. For example, the University of Hong Kong relocated its Western Salt Water Service Reservoir to a rock cavern in 2009, releasing surface land for the Centennial Campus.

Research suggests that Hong Kong’s geological conditions are particularly suited for developing caverns. The relocation of the Sha Tin Sewage Treatment Works is expected to free up around 28 hectares of land from the current site for other beneficial uses. The preliminary plan of the government is to develop housing on the original site, along with community facilities and passive open space such as a waterfront promenade. The goal is to create a well-equipped community and promote the sustainable development of Hong Kong.

Relocation of Sha Tin Sewage Treatment Works to Caverns will build one of the largest man-made cavern sewage treatment plants in Asia. We introduced BIM, 4D immersive computer virtual environment and geographic information system technology in this project, which, in combination with MIC and DfMA technologies, effectively enhanced construction efficiency, saved construction materials, significantly improved project quality, and reduced the carbon footprint. In addition, a wide range of innovative environmental technologies and measures have been adopted at the project. The project received professional recognition on local and global scales and gained a number of awards for these technologies, which demonstrates CSHK’s achievements in sustainability and construction technology.
Sustainable design and innovative construction methods

- Adopted DIMA technology to design pre-assembly noise screens for recycle use.
Use Renewable Energy

- Installed solar-powered CCTV systems to monitor the quality of discharged water at project sites
- Installed solar-powered noise metres to monitor site noise 24/7
- Solar-powered LED streetlamps
- Solar-powered mosquito lamps and mouse repellers
Waste Reuse

- Reuse construction waste at project sites, such as using extracted stones for temporary drainage diversion

Site Greening

- Using recycled plastic bottles and used water barriers to grow potted plants at project sites and on the hoarding

- Waste upcycling

- Greening office rooftop with plants
Green Building Projects

In 2021, the government issued Hong Kong's Climate Action Plan 2050 to transition Hong Kong towards carbon neutrality by 2050. The Action Plan proposed energy saving and green buildings as one of the four major decarbonisation strategies. According to Hong Kong's sources of carbon emissions data in 2019, buildings accounted for 90% of Hong Kong's electricity consumption, which amounted to about 60% of Hong Kong's total carbon emissions. In view of this, green buildings are instrumental to Hong Kong's carbon neutrality goal. Green building is a practice of minimising the environmental impact of a building by planning throughout its lifecycle, from siting to design, construction, operation, and demolition. As a leader in promoting environmental innovation in the construction industry, CSHK advances green buildings development in active terms. A variety of green building technologies have been applied to our construction projects to minimise the environmental impact of the projects while satisfying the needs of the community.

CUHK Medical Centre

Recognition:
BEAM Plus New Buildings Version 1.2 - Final Platinum

CUHK Medical Centre, located at Ma Liu Shui in Sha Tin District, is set to be the first non-profit, self-financing, private teaching hospital in Hong Kong. It is expected to offer 516 inpatient beds, 28 operating rooms, 49 specialist consultation rooms, 8 accident and emergency consultation rooms, and an outpatient surgery centre. In addition to providing comprehensive healthcare services to the public, it will also serve as a key site for conducting clinical research and healthcare education. All profit will be used to support the long-term development of the Centre and research at the CUHK Faculty of Medicine. The project includes a fourteen-storey hospital building with a gross floor area of 100,000 square meters. Construction work commenced in August 2016 and the Centre started operation in January 2021.

As Hong Kong's first main contractor to design and build a non-profit private hospital project, CSHK has been working closely with the design team, introducing multiple systems to achieve the smart hospital principle embedded in the project. In addition, CSHK has adopted various innovative green construction technologies and digital management systems during the construction phase, enabling CUHK Medical Centre to become a leading example of Hong Kong's green and innovative building practices.
Offer 516 inpatient beds, 28 operating rooms, 49 consultation rooms and 8 emergency consultation rooms.
Green Building Concept of CUHK Medical Centre

**Enhance Ventilation and Avoid Wall Effect**

The sky garden is located on a middle level of the building. In addition to adding greenery, the garden facilitates heat dissipation in the building. According to computational fluid dynamics simulations, the garden effectively increases air exchange on the leeward side, reduces the heat island effect, and improves air quality.

**Effective Use of Natural Lighting**

During the construction phase, natural lighting was extensively used in the office area and enclosed walkways of the project, which reduced the use of tube lights and electricity. The sky garden and central courtyard enhance natural lighting in the centre of the building.
Reduce Resources Consumption

- Use FSC-certified eco-friendly timber.
- Use System Formwork and prefabricated components. 80% of the stairs in the building were prefabricated, which effectively reduced wood waste.

Water Saving and Recycling

- During the construction phase, automatic sensor faucets were installed in toilets and shower rooms. Wastewater treated by treatment tanks and sewage treatment systems was diverted to toilets for flushing, in order to save and recycle water.

- Water consumption and wastewater discharge of the building are expected to decrease by 24% and 57% compared to the BEAM Plus baseline.
- Harvesting rainwater and condensate water for irrigation.
Site Management Measures

Air quality and noise management measures

- In terms of dust control, the project used "mist blowers" to effectively reduce dust and cool down the site. We fully adopted QPME-certified mechanical equipment at the project, which is quiet, efficient, up-to-date, and environmentally friendly.

- Apart from on-site control measures, regular air quality and noise monitoring was carried out around the site by third-party environmental consultants engaged by the project.

Waste management

- In addition to three-coloured waste separation bins, a plastic bottle recycling device has been installed on site, which provides discount coupons for site workers who recycle plastic bottles. By doing so, we encouraged site workers to participate in waste recycling and separation.

- Automated waste collection system was installed on site for efficient and hygienic waste collection.

- Food waste treatment equipment units were installed on site to turn food waste into liquid, thus reducing the volume of waste.

Integrated application of renewable energy technology

- The project installed solar panels on the rooftop to convert solar energy collected during the daytime into heat, which will help to supply hot water to the hospital and thereby reduce energy consumption.
Energy-saving features

- Vertical panels on the facade to block excessive daylight
- Greenery area amounts to 20% of the project. Extensive vertical greenery and the sky garden reduce urban heat island effect

- This project uses glass with low overall thermal transfer value ("OTTV") for the exterior of the building to reduce the amount of solar radiation entering the building while maintaining lighting. It eases the load of the AC system, thus saving energy and achieving carbon reduction
Hong Kong Palace Museum

Awards:
1. The 27th Considerate Contractors Site Award Scheme
2. Outstanding Environmental Management and Performance Awards– Non-Public Works – New Works Group A - Silver Award
3. Autodesk Hong Kong BIM 2021– Honorable Mention
The Hong Kong Palace Museum is located in the West Kowloon Cultural District and is the first museum outside Mainland China to be named after Beijing’s Palace Museum. As an important cultural project clearly proposed in the Outline Development Plan for Guangdong-Hong Kong-Macau Greater Bay Area, the museum displays the priceless collections from the Palace Museum for Hong Kong residents and tourists to enjoy Chinese arts and culture and for promoting Sino-foreign cultural exchanges. The main block of the museum is seven-storey high and the building floor area, together with the surrounding parking lot and transportation facilities, is around 43,000 square metres.

The project is interwoven with an avant-garde design and high-quality management, using innovative techniques to reinterpret the visual and spatial aesthetics of Chinese tradition. CSHK has also implemented AI management in multiple aspects during the construction process as an example for modern construction.

We have adopted AI technology on this project on a large scale, in order to make site safety and environmental statistics clear at a glance and enhance the safety of personnel and resource usage.
Water quality monitoring devices were installed on wastewater treatment plants to monitor parameters such as pH value, dissolved oxygen levels, temperature, water level, and amount of discharge in real-time, to ensure proper wastewater treatment, the real-time parameters can be remote monitored through mobile devices.

Real-time environment monitoring

Devices were set up in various locations of the construction sites to monitor in real-time, eight types of environmental data, including PM2.5, PM10, noise level, temperature, humidity, wind speed, wind direction, and wind intensity. In terms of dust suppression, there is a real-time monitoring system for construction dust, which can automatically activate the linked sprinkler system when the amount of dust detected exceeded the default values, through a cloud platform, management can access and real-time monitor the data on their mobile devices.
CSHK has been committed to building consensus on sustainability with all sectors of the community. Through close communication, coordination, and cooperation, CSHK has established mutual trust with employees, business partners, and other stakeholder groups. With excellent quality, safe construction, and professional teams, CSHK has developed a successful business operation.
The steady development of CSHK over the years depends on the contribution of our employees. To build an enthusiastic, motivated, and harmonious team, we continue to improve our human resources management system and create a sound working environment.

**Attracting Talents**

CSHK plans to recruit 1,000 new employees in Hong Kong each year during the 14th Five-Year Plan period. In addition, during the reported period, CSHK has developed the “Hong Kong ‘Double Hundred’ Youth Development Program” (the “Double Hundred” Program) to create a better environment for young people to grow and thrive. The “Double Hundred” Program offers at least 100 jobs in the Greater Bay Area for graduates of Hong Kong’s tertiary institutions and 100 internship and exchange opportunities in the Greater Bay Area for Hong Kong students each year. It provides young people with a wide range of job opportunities in the construction engineering field. We also developed systematic talent cultivation and development based on the above recruitment and internship schemes. Supporting resources include inviting young staff to participate in the “Great Nation Construction” campus presentation, “Executive Face-to-Face” activities, and “Construction Technology Interactive Experience Day” for summer interns.
Cultivating Talents

CSHK has launched various training programs for professionals and young talents to establish a sound talent development system. Furthermore, for young employees, we have formulated the Core Talent Cultivation Management Regulations and Trainee Engineer Cultivation Management Regulations in line with the Company’s development plan to fully open up the career development path from school enrolment to the core staff and then to leadership talent, and establish a sound talent cultivation system for the whole process to provide talent support for strategy implementation, reform, and innovation.

CSHK also actively promotes the integration of Hong Kong staff into the country’s overall development. We will send 1,000 Hong Kong staff across the Shenzhen River to work and live on the Mainland to promote the integration of Hong Kong professionals with the development of the Greater Bay Area, in line with the “Thousands of People Crossing the River Project” planned by CSCEC during the 14th Five-Year Plan period. CSHK provides an attractive platform for potential and aspiring professionals and young people from Hong Kong to work in the Greater Bay Area or for short-term job rotation and exchange, in the hope that they will become highly qualified, broad-minded, patriotic, and Hong Kong-loving construction talents who understand the overall development of the country and form a core force that will have an impact on the development of the construction industry in Hong Kong.

We attach great importance to the growth of each echelon and team building, insisting on people orientation to retain excellent talents. Committed to protecting and safeguarding the rights and interests of our employees, we comply with legal requirements regarding minimum wage, overtime work, holiday work and other employment-related requirements, and formulate, review, and update relevant policies and guidelines such as the Employee Handbook in accordance with the latest laws and regulations. Policies and systems for compensation, dismissal, recruitment, promotion, appraisal and benefits are stated clearly in the Employee Handbook.
Equal and Diversified Workplace
Committed to creating a fair, lawful and equal working environment, CSHK has established a policy on the prevention of discrimination and harassment in the Employee Handbook, stipulating that all recruitment, promotion, transfer, training, dismissal, layoff, and employment conditions must follow “uniform selection guidelines”, which requires that employees will not be discriminated because of their gender, marital status, pregnancy, disability, family status, and race. The policy also defines workplace harassment, including sexual harassment, and provides guidance on handling such situations. Employees are provided with sound consultation and reporting channels to ensure that their rights and interests are fully protected.

We also encourage a diversified workplace where a diversified and harmonious workforce can bring diversified mindsets, skills, and experience. We encourage exchanges between employees from different cultural backgrounds, such as “Hong Kong local recruitment” and “Mainland Recruitment and Dispatch”, creating synergy through enhanced communication. In addition, we have set up the “Volunteer Camp” platform to help our Mainland dispatch employees improve their understanding of Hong Kong and adapt to the new environment faster through the three sections of “Learning and Practice”, “Social Responsibility” and “Employee Care”.

Nurturing Professional Talents
Shouldering the mission of attracting and nurturing talents in the construction industry, CSHK has consistently invested in employee development, improving our training system, providing comprehensive career planning and mentorship in response to the needs of different roles, thereby cultivating outstanding talents for the future construction industry. Through the “Core Talent Pool Scheme”, we identify talents with high potential and improve our talents supply chain.

We provide a wide range of internal training and external training to employees in the following four major training areas, such as topical seminars, symposiums, exchange sessions, workshops, and visits.

Compliance Training
• Cultivate employees’ awareness of integrity and compliance with laws and regulations, and regularly keep them familiar with the various laws and regulations related to the operation of the industry, such as requirements on quality, safety and environmental protection

Corporate Culture and Procedures Training
• Enable employees to master the internal regulations, procedures and requirements of the company’s system and policies

Professional Knowledge and Technical Training
• Enable employees to keep updated with the latest industry knowledge and technology from time to time in order to enhance the overall professional performance and competitiveness of the company

Personalised Value-Added Programme
• Enable employees to develop their potential, broaden their horizons and equip themselves for more responsibility in the future

Four Major Training Areas
Internal Training
CSHK takes its initiative to identify promising talents within the Company and offers various training opportunities. Internal training courses are provided for our employees based on the actual needs of each department, covering areas such as quality, safety, environmental protection, policy, and construction technology, in an effort to enhance their professional knowledge and skills. Since 2007, we have been preparing our talent development programme. To identify and nurture employees with development potential, we have also set up medium-term and long-term training programmes, including the “Trainee Engineer Training Scheme”, the “Apprentice Training Scheme” and the “Shadow Scheme”, thus promoting the self-enhancement of employees, aligning employee growth with corporate growth, and driving personal and organisational sustainable development.

“Trainee Engineer Training Scheme”
Since the launch of the training scheme in 1997, CSHK has trained a total of 500 professional engineers.

Each year, CSHK takes in top-performing fresh graduates as trainee engineers. The Company has formulated the Training and Management Measures for Trainee Engineers. In combination with Scheme “A” of the Hong Kong Institution of Engineers, we created a more comprehensive system to cultivate trainee engineers. The system includes training modules such as the Partner Program, Shadow Scheme, Tomorrow’s PM and covers the mentor accountability system (six mechanisms), professional committee, youth federation, youth training scheme, assessment and promotion mechanism, and compensation and benefits. The system aims at cultivating professional managerial talents for the future in an all-round way. A Trainee Engineer will be promoted to Engineer upon satisfactory assessment results after three years of work, then to Senior Engineer upon satisfactory assessment results after three years of work, and to Assistant Project Manager upon satisfactory assessment results after two years of work. In particular, Trainee Engineers with outstanding performance will be promoted to Assistant Project Manager in six years, becoming the core management talents of the Company.

During the Reporting Period, CSHK provided training to 6,968 employees with the total hours of training reaching 29,745 hours.
“Face-to-Face with Senior Management” Event
During the Reporting Period, we organised an event titled “Face-to-Face with Senior Management” for the management to share our corporate culture and corporate development strategies with young employees. The event attracted more than 100 trainee engineers.

“Apprentice Training Scheme”
To encourage young people to understand and join the construction industry, CSHK has been running the “Apprenticeship Training Scheme” since 2009. With a training period of three to four years, apprentices are mainly recruited in building construction, civil engineering, building services, quantity surveying, mechanics, among other professional disciplines. The Scheme provides apprentices with front-line supervision skills, technical knowledge and management skills, equipping them with essential professional skills.

“Shadow Scheme”
Over the years, CSHK’s employees have passed on their accumulated experience and skills to the younger generation, contributing to the strong presence of the Company in Hong Kong’s construction industry. Focusing on passing on knowledge to the next generation, we launched the “Shadow Scheme” to identify and cultivate promising young employees. The Scheme offers important training opportunities and allows them to develop knowledge and skills in business operation and management from the President of CSHK.
External Training
To encourage the self-enhancement of employees out of the workplace, we offer educational subsidies and examination leave to employees who wish to obtain a job-related diploma or degree. Eligible employees can receive subsidies ranging from 20% to 50% of the course fees and examination leave of not more than two days per year.

In addition, after passing the probationary period, all employees at CSHK’s subsidiaries or contract employees at construction sites in Hong Kong may apply to the Group for financial assistance to take courses related to their job or for self-enhancement, such as courses required or prescribed by law, courses required or prescribed by site contract, courses related to their job position and career development, or courses related to industry trends.

I joined CSHK in 2017 upon graduation and gradually developed my career path. I planned to complete a master’s programme in structural engineering and obtain qualifications of MICE, CEng and MHKIE (Structural Discipline), applying my expertise in the field of structural engineering. CSHK has been hugely supportive as I pursue my career goals, offering a scholarship to help me complete my master’s studies. CSHK also encourages us to take continuous professional development (CPD) courses and has organised a series of training.

In addition to workshops on how to become a chartered engineer, I also had a lot of opportunities to visit project sites, where experienced speakers shared their knowledge on the process of engineering projects, factors affecting a project, etc. Moreover, I got to directly ask the speakers questions. These are things I will never learn on online platforms and forums.

In addition, my supervisors at the site and tutors provided me with a lot of guidance. They not only shared their notes but also offered to give mock interviews before the exam, so as to understand where I was and where I did not understand. They were the best judges to me, as they told me where I could improve, so that I could really prepare for everything before the exam.

Ho Man Hoi
Trainee Engineer
CSHK is very willing to invest in employee training. From my experience, I was particularly impressed by a two-day public speaking workshop. The instructor provided immediate feedback after I presented my briefing, telling me clearly where I did a good job and how I could improve, so that I could adjust my briefing accordingly and try again. The workshop was very helpful. I learned that I need to pay attention to where I stand and how I pose when giving a speech. It improved my public speaking skills and body language skills by a mile and was useful for my chartered engineer exam.

CSHK also offered many site visit opportunities for me to learn about the experience of others and broaden my knowledge. At the end of 2021, I visited the Tseung Kwan O Desalination Plant site, a key project of the Company. I learned about the construction procedures and technologies as well as the high-tech equipment there. I also saw a gym and basketball court at the site, which was much to my surprise. I was happy to gain experience from the visit.

I still remember the mountain craft course organised by CSHK. My trainee engineer colleagues and I were divided into different teams. We used a map to locate ourselves and got to communicate and work with each other. The activity allowed me to meet fellow trainee engineers working at other sites and exchange with them, which deepened our friendship. I look forward to more team building activities in the future!
Caring for employees

Under the slogan "Building Dreams with One Heart, Managing Happiness", CSHK pays close attention to the well-being of our employees. We extend our care to employees through regular events and activities and improve their sense of belonging and happiness by listening to their voices.

Sending Employees Sticky Rice Dumplings on Dragon Boat Festival

For the second year in a row, we worked with Ginkgo House, a social enterprise restaurant, to distribute sticky rice dumplings to employees as a holiday gift.

Caring for Site Personnel on the Birthday of Lo Pan, Master Craftsman in Ancient China

We organised the "Celebrating the Birthday of the Master, Promoting Happiness for All" event on Lo Pan's birthday. The event combined online and offline methods. COVID-19 prevention packages and meal boxes were distributed to site personnel at the Hong Kong Palace Museum site. More than 70 sites connected online to celebrate the master's birthday.

Employee Health and Safety

CSHK places high value on the health, safety and well-being of employees. To this end, we have established a sound occupational health and safety management system, formulated various internal guidelines and safety management objectives, and implemented strict safety measures to actively and consistently eliminate safety hazards and risks, creating a safe and harmless workplace for employees.
**Occupational Health and Safety Management System**

We are dedicated to ensuring the safety and health of all employees, as well as subcontractors and the public affected by the construction works. We are committed to:

- Establish a safe and healthy working environment of high standard by putting safety and health matters at our foremost concern.
- Regularly assess and communicate safety and health hazards and risks arising from construction works.
- Provide safety education and training to employees.
- Establish effective communication and consultation channels for employees.
- Allow employees to participate in the decision-making processes of occupational health and safety management system.
- Strictly comply with regulatory and contractual requirements.
- Promote safe behaviour among workers through safety climate surveys.
- Adopt reasonable and feasible measures and innovative methods to continuously improve safety and health performance, thus achieving sustainability goals.

To prevent accidents and serious work-related accidents, avoid prosecution arising from violation of regulations, and continuously reduce the incidence rate of work-related injuries, we update safety and health goals and targets and perform safety audits every six months, thus monitoring our overall safety and health performance. We have established a series of standard working procedures in accordance with the relevant requirements of ISO 45001 Occupational Health and Safety Management System. Our safety-related work is managed in accordance with the following processes.

As our dedicated department for routine safety matters, the Safety and Environmental Protection Department is responsible for promoting the implementation of the health and safety management system and the Safety and Health Policy at all projects and reporting regularly to the Integrated Management Committee. Meanwhile, other departments shall provide assistance in safety-related work. Each site is required to set up a Site Integrated Management Working Group according to the actual situation, with the site manager as the first person in charge of managing the civilised construction of the site.
Create a “Safety First” Culture

Committed to fostering a sound safety culture, CSHK strives to regulate the behaviours of site workers through incentive systems, training, and promotional activities. We have formulated the Site Safety Management Award Scheme to offer cash incentive to sites that meet our requirements, thereby encouraging site management personnel to actively participate in improving site safety and implementing safe construction. In addition, we organised the “Behavioural Safety Star” activity at various sites, which rewards site workers who satisfy behavioural safety standards with redeemable prize cards. Site workers selected as “Behavioural Safety Star” shall receive cash incentive.

We provide a wide variety of site safety and health training, including induction training, safety card training, topical training, site seminars, and management training to help site personnel understand safety and health practices and requirements. During the Reporting Period, we launched the “Life First” promotion campaign and construction site fire safety regulations training, aiming to enhance the safety awareness of staff at all levels.

In addition, we have formulated the Area Responsibility System for the Safety and Environmental Management of Front-line Site Management Staff, under which sites are zoned according to the nature and staffing scale of the project, promoting the implementation of the area responsibility system for the safety and environmental management of front-line site management staff. Reward and punishment mechanisms have also been clearly defined. We have also formulated the Safety Management Regulations for Site Representatives of Sub-contractors, stipulating that site representatives of sub-contractors shall be responsible for regularly monitoring the safety of sub-contractors’ workers, attending Site Safety Committee meetings, and implementing relevant requirements on safety measures. We have set up an award mechanism, where “Safety Representatives” are selected every month by the site civilisation construction team according to the monthly safety management performance of the sub-contractor representatives and the safety performance of their workers, they would be awarded certificates and cash incentive.
“Life First” Promotion Campaign
At the invitation of the Construction Industry Council, we launched the "Life First" promotion campaign from May to June 2021 at over 30 construction sites. The campaign reviewed four major high-risk activities, including 1) Working at height; 2) Lifting; 3) Heavy Machinery; and 4) engineering work involving electricity, with a view to reducing serious or fatal accidents.

In addition, the Safety and Environmental Protection Department regularly carries out a variety of safety promotion activities, including the “Fortune in Spring”, “Summer Rainbow”, and “Warming the Winter”, requiring sites to implement and organise inspection and training according to the themes. We formulate key safety monitoring themes every month and organise relevant safety training for all levels of site personnel. By doing so, we have enhanced site safety management and eliminated safety hazards.

As of the end of the Reporting Period, CSHK has organised
More than 4,600 people participated in the program
39,155 training sessions which covered 2,275,881 person-times
“Fortune in Spring” Safety Promotion Campaign
From February to April, we conducted safety promotion activities under the theme of “Fortune in Spring”, including themed safety training and related promotion activities. A comprehensive inspection of high-risk processes was performed each month according to the themes. Hidden hazards have been detected and rectified to ensure “zero workplace injuries, zero prosecutions, zero accidents”.

“Summer Rainbow” Safety Promotion Campaign
Site workers are more prone to accidents when working in hot and rainy environments in mid-summer. To strengthen the safety management at construction sites during high-risk seasons, we launched the “Summer Rainbow” safety promotion campaign from May to September 2020, during which the following measures have been implemented.

- We organised special safety training for each month’s campaign theme and high-risk processes
- We organised comprehensive inspections every month by our safety person-in-charge, frontline management personnel, safety management personnel, sub-contractors’ representatives, and other relevant personnel on the campaign themes and high-risk processes, and made improvements as soon as hidden hazards were identified
- We required front-line management personnel to pay more attention to the health of workers. If any worker is found to be unwell, the front-line management personnel should ask the worker to leave the site and seek medical treatment in a timely manner

<table>
<thead>
<tr>
<th>Month</th>
<th>Theme</th>
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<tbody>
<tr>
<td>February</td>
<td>Work Safety Month Before and After Holiday</td>
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<tr>
<td>March</td>
<td>Traffic Safety Management Month</td>
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<tr>
<td>April</td>
<td>Site Machinery Safety Month</td>
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<tr>
<td>May</td>
<td>Site Housekeeping + Working Near Floor Edges and Fire Prevention Measures</td>
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<tr>
<td>June</td>
<td>Safety Use of Electricity + Management of Floor Holes and Control and Supervision of Electrical Charging Activities</td>
</tr>
<tr>
<td>July</td>
<td>Safety for Working Under High Temperature + Lift Shaft Work and Protection of Protruding Steel Bars</td>
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<tr>
<td>August</td>
<td>Work-above-ground Safety + Suspended Working Platform Operation and One Traffic Controller for One Mobile Plant</td>
</tr>
<tr>
<td>September</td>
<td>Crane Hoisting Safety + Trench Excavation and Demarcation Between Site Personnel and Vehicles</td>
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Nearly 3,500 people participated in the campaign
For example, in May the “Site Housekeeping Month”, construction sites followed CSHK’s requirements and made an effective use of resources for continuous housekeeping, thus improving site safety management and reducing work-related injuries.

“For Warming the Winter” Safety Promotion Campaign

“Warming the Winter” safety promotion campaign was launched to strengthen the safety management of construction sites, clarify CSHK’s safety management system and existing safety regulations, and improve the safety awareness of each site personnel. We organised safety promotion and inspection according to the following themes to comprehensively boost the safety awareness of site personnel and eliminate safety hazards. Any problems detected must be rectified as soon as possible to prevent accidents.

<table>
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<tr>
<th>November</th>
<th>Fire Safety Month for Fire Prevention on Sites</th>
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<tr>
<td>December</td>
<td>Safety Month for High Risk Processes</td>
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Benefit packages were distributed to site personnel to promote construction safety.
Safeguarding Employees’ Health

CSHK took immediate actions to support and protect our employees in the face of the COVID-19 outbreak. We have established the CSHK COVID-19 Prevention and Control Leadership Group responsible for the overall pandemic containment in CSHK. In addition, we have formulated a series of guidelines including the CSHK Employee Epidemic Prevention and Control Handbook, the Guidelines of CSHK Office Epidemic Prevention and Control, and the CSHK Site Anti-epidemic Guidelines to guarantee that employees can work safely regardless of the virus.

As of the end of the Reporting Period, we have distributed

- **9,380,000** masks
- **370,000** N95 respirators
- **20,000** alcohol-based hand sanitisers and disinfectant sprays
- **231,000** sets of rapid antigen test kits

Employees’ physical and mental health is our focus during the pandemic. We specially set up an employee care group in the hope that employees were buoyed by the care and support from CSHK even under the pressure of the fight against the virus. In addition, employees, whether monthly paid or daily paid, could have days off for vaccination. To encourage COVID-19 vaccination, we launched the vaccination lucky draw where any eligible employee could sign up for the lucky draw to win cash prizes. To raise employees’ pandemic control awareness, we made a series of how-to videos to help employees protect themselves in right ways. Most importantly, we invited Dr. ZHAO Lili, CSIM’s Director of Operations, and Dr. LI Deshuai, Deputy Director of Respiratory Department of Beijing Renhe Hospital, to expound on new coronavirus and personal protection at two lectures.

We endeavour to establish a powerful shield to protect employees’ health. All employees must finish visitor health declaration and temperature checks before entering the office and work in separate groups if the pandemic situation obligates so. The office is disinfected more often. At densely populated and highly mobile construction sites, we require all localities to establish an organisational structure system for site pandemic prevention and appoint personnel responsible for pandemic prevention. To reduce the risk of COVID-19 infection and transmission among construction workers, we have implemented strict pandemic prevention measures, including:

- All construction sites need to formulate special pandemic prevention and control plans and emergency plans, which specify the anti-epidemic measures, standards and processes at the sites
- Ensure the sterilisers work at the entrance of the construction sites by regularly adding disinfectants
- Put up posters at the entrance of the construction sites, workers’ lounge, and other conspicuous locations, asking visitors to wear masks on site
- Require employees to work in separate groups, and avoid close contact between Group A and Group B
- Implement grid management at the construction sites. Record the locations and grids where construction works stand by the time slots of the day to minimise the number of workers in each grid. Track close contacts immediately in the event of any confirmed case
Construction sites are required to conduct health checks on all personnel, where all site personnel must report their health status and that of their family members and must fill out a site personnel health declaration form and take their body temperature every time before entering the site. If any site personnel are feeling unwell, they will be prohibited from entering the site. Meanwhile, we have implemented a grid-based site management system to record the location and grid of the personnel by the time slots of the day to ensure that close contacts can be traced immediately in the event of a confirmed case. To further reduce the risk of infection at the site, we have developed the following site access management procedures:

1. **Induction**
   - Conduct nucleic acid test
   - Receive induction COVID-19 prevention training

2. **Going to work**
   - Take body temperature
   - Clean vehicles
   - Implement a work permit system

3. **Entering the site**
   - Submit a health declaration form
   - Take body temperature and conduct disinfection

4. **Daily work**
   - Require wearing masks all the time and take body temperature
   - Wash hands
   - Have meals in good order

5. **Leaving the site**
   - Require queuing in an orderly manner
   - Take body temperature
   - Implement a work permit system
Collaborating With Partners for Continuous Win-Win Results

Rooted in Hong Kong for over 40 years, CSHK has been helping build the great city with extraordinary projects and rigorous management to respond to customers’ demands and expectations. We also proactively drive the creation of a transparent and responsible supply chain. We are committed to establishing long-term and reciprocal partnerships with all stakeholders in the value chain to jointly promote a sustainable business model.

All-round Quality Management
Taking a customer-oriented approach, CSHK maintains close communication with them in the process of work planning, implementation, and inspection to know and satisfy their demands and expectations. We continuously enhance the quality management system to provide them with excellent services and high-quality products.

CSHK’s Service Commitment

- Identify and comply with local laws and regulations and requirements of the owner’s contract
- Ensure employees are equipped with the capabilities to address relevant risks and opportunities in products and services and improve owner satisfaction
- Target at continuously increasing owner satisfaction
Quality Management System

The quality of construction is the top priority of the construction industry. Upholding the principle of “alright for one time, alright for all times”, CSHK has established, implemented, and continuously improved our quality management system following the requirements of ISO 9001:2015 Quality Management System. We devise sound quality control processes, prepare work procedures, and strengthen material and process management, striving to deliver a better life to users with first-class projects.

To reinforce project quality management, we have established a quality management framework and listed the responsibilities and powers at all levels in the Quality Management Manual. President of CSHK, the overall responsible body for quality management, makes decisions on CSHK’s quality strategies; Integrated Management Committee acts as the cross-departmental quality, safety and health, and environmental management body which formulates and implements CSHK’s quality policies and measures; Integrated Management Director, the representative manager, establishes, carries out, and monitors the quality management system and management processes; Quality Management Working Group assists the Integrated Management Committee in applying quality management measures, proposes policies and actions, and prepares and reviews annual quality audit plans; Quality Technology Department undertakes routine works for the Quality Management Working Group, including quality-related publicity, popularisation, and training, as well as monitoring of the operation and performances of quality management system at the construction sites; engineering departments, engineering companies, construction sites and other units promote the quality management system and practice quality management measures; as the chief engineer of the units, heads of quality and technology at engineering departments and engineering companies coordinate quality and technology management, conduct project quality inspection and monitoring, investigate and follow up quality accidents with improvements and supervision; The Site Integrated Management Working Group researches and improves the project quality, and implements the quality control on the construction site.
To take continuous steps to communicate and promote our quality system, we have summarised the key points of our quality management system and produced a 4X100 system, which stipulates that we must honour our commitments, stick to our goals, implement our measures, aim at continuous improvement, perform self-check on 100% of key processes, and put quality management in place at both project level and corporate level.

Reinforce Quality Management
In order to strengthen our performance in product and service management, our Quality Management Manual specifies CSHK’s organisational structure, planning, resource management, project management, and quality performance evaluation. We also formulate guides to standard procedures to guide managers and construction staff on engineering projects of different nature and requirements. In addition, we set quality objectives and indicators according to owners’ requirements and review them once a year. We make every effort to familiarise all stakeholders in the value chain with those objectives and indicators. Besides, we continuously monitor and review customers’ demands, and integrate their newest needs into the business operation to effectively improve the quality management.

We have developed a series of quality monitoring guidelines as well to ensure all project processes are up to standard and better meet the contracted terms about quality projects. Quality-related pamphlets – such as the Waterproof Quality Monitoring Guidelines on Housing Engineering, the Quality Monitoring Guidelines on Concrete Prefabricated Units, and the Quality Monitoring Guidelines on Welding Process, the Quality Monitoring Guidelines on Heavy Steel Structures - list many main points: laws, regulations, and standards, risks, preparation in the early stage of construction, requirements on acceptance and significant inspection tools of relevant processes, to raise employees’ awareness of good quality in construction.

We require each project to formulate a Project Management Plan in accordance with the project contract so that the quality management system set out in the Quality Management Manual runs effectively on the project. The Project Management Plan documents a comprehensive management system covering project quality, safety, health, and environment management. The Plan outlines the necessary procedures, quality control measures, construction plan and staffing, equipment testing and inspection, and construction machinery and equipment, depending on the needs of the project and the potential quality risks identified. The site leader is supposed to review them every three months to six months to ensure their effectiveness. To advance our smart construction progress, we have been transitioning to digital preparation and formulation of Project Management Plans.

In addition, we have a project quality performance evaluation mechanism. Every project should add processes and methods for monitoring, measuring, analysing, and improving performance to its Project Management Plan. Besides, every project collects and analyses data to evaluate the applicability and continuously improve the quality management system.

Data analysis includes the following dimensions:

- Compliance with product requirements
- Owners’ satisfaction rate
- Applicability and effectiveness of the quality management system
- Implementation effectiveness according to the plan
- Effectiveness of risks and opportunities handling
- Performance of suppliers, sub-contractors, and other outsourced providers
- Areas for continuous improvement of the quality management system
Meanwhile, we regularly conduct internal audits in accordance with the Internal Audit Work Procedures on Quality Management. The efforts aimed to ensure that our quality management system conforms to the established construction processes, requirements of the ISO 9001:2015 Quality Management System, and requirements of CSHK’s quality management system. In an active effort to cultivate quality management talents, we organised employees to participate in IRCA & HKICA Certified ISO9001: 2015 Quality Management System Lead Auditor Training for them to qualify for the examination for HKICA Lead Auditor, thereby improving the professional competence of quality engineers in engineering companies. As of 2021, 44 CSHK employees successfully registered as Certified Internal Auditors.

**Prevent Quality Risks**

We have formulated the Project Construction Quality Risk Assessment and Management Work Guidelines to guide each project leader to inspect, manage and timely respond to potential project risks. The quality leader of each construction site, for instance, needs to organise quality risk assessors to prepare the Construction Quality Monitoring Work Plan. He should fully assess the quality risks that occurred in the monitoring process set out in the Work Plan by considering the factors provided in the Guidelines to properly manage the potential quality project risks.

Quality risk assessment factors include but are not limited to:

- Internal and external risk factors of CSHK
- Site environmental risks including risks related to construction environment and geology
- Construction quality risks
- Construction information risks
- Material and sub-contractor management risks
- Finished product risks
- Requests and expectations of relevant stakeholders or stakeholder groups, owners or owner representatives, neighbours, users, etc.
- Quality risks related to pre-construction preparation, expected completion processes and results

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**Promoting Sustainability**

[Link to sustainability special issue]

**Promoting Innovation**

**Building Consensus**

**Creating Value**

**Appendix**

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2021 Sustainability Report
The construction sites are required to formulate risk monitoring measures against significant construction quality risks identified and timely review them as they may be. Each construction site should designate personnel to monthly inspect, review and identify how effectively the quality risk monitoring is implemented. In the event of any ineffective measures, the personnel should report to the site quality manager or quality engineer and record them in the Construction Site Quality Management Work Report to follow up on the effectiveness of the improvements.

CSHK works on assuring the construction quality with sophisticated quality risk prevention, and strictly controlling the construction materials, processes, and on-site work. We have formulated the Construction Management, Inspection, and Test Work Procedure, which details the whole procedures: inspect and test incoming materials; use and manage inspection, measuring, and testing equipment; start construction; control and treat construction and non-conforming materials; count, analyse and give early warning of site quality. All processes must be completed in accordance with the requirements of the owner and laws.

- The site leader shall appoint employees to finish pre-acceptance as required before the project is completed and delivered to the owner
- The site leader should add post-delivery service plans to the Project Management Plan as per the contract, including how to implement, supervise and inspect the quality of the post-delivery service
- The site leader should review the nonconformity of materials or work identified by the owner and site inspectors, and formulate effective prevention and control measures.
Construction Information Management System (CIMS)

Committed to blending construction and innovative technology, CSHK has been promoting the application of CIMS to projects. CIMS, an intelligent collaboration system in quality, safety, and equipment, transmits and records information beyond the traditional method, creating better efficiency and quality. The construction managers can connect the CIMS with mobile internet tools, such as mobile phones, to instantly record the problems found during the project inspection or when accepted by owners in real-time. The system also simultaneously requires the subcontractor to follow up and track the progress. During the Reporting Period, CSHK developed and continued to improve new software for project inspection and quality inspection, which helped local site managers to conduct self-inspections of quality and scrutinise key processes. Furthermore, we applied that software in many projects including the Hong Kong Palace Museum and the Chinese Medicines Hospital for more sophisticated project management.

<table>
<thead>
<tr>
<th>Efficiency Enhancement</th>
<th>Empowerment</th>
<th>Digitisation</th>
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<tbody>
<tr>
<td>• Send information to all stakeholders of the project team in real-time</td>
<td>• Project staff to check the progress</td>
<td>• Record tens of thousands of problems and complaints about quality, safety, process, and acceptance</td>
</tr>
<tr>
<td>• Timely identify problems, rearrange work schedule, and effectively control potential risks</td>
<td>• Enable quality inspection, safety inspection, schedule management, materials management, and equipment inspection</td>
<td>• Prepare various data analysis reports on the results, and make them available through computer devices at any time</td>
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<tr>
<td>• Design a unique mark for each process, which automatically records each link; enable real-time access to process files</td>
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<td>• Achieve paperless operation</td>
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Improving Communication with Customers

CSHK is deeply aware that good reputation is a natural result of customer satisfaction. Therefore, we value customers’ opinions and continuously expand channels to communicate with customers and respond to their feedback. We work to establish a good and harmonious relationship with customers. Any customer can give his or her feedback through letters, phone calls, and e-mails, among others. To deal with customers’ opinions and complaints, our Customer Opinion and Complaint Handling Work Procedures defines the scope of complaint handling, the responsibilities of units concerned, complaint handling and recording procedures, etc. After receiving any customer feedback or complaint, the staff of the department, subsidiary, and site should classify them into three types: those from the owners, those from the outside, and those from the media, as specified in Customer Opinion and Complaint Handling Work Procedures. Meanwhile, they should take timely steps to handle complaints, and describe in detail the follow-up results to continuously improve customer satisfaction.
**Sustainable Supply Chain Management**
The construction industry relies on a complex supply chain operation model. To facilitate a low-carbon supply chain in a joint effort with supply chain partners, CSHK needs to maintain close cooperation with suppliers and subcontractors while continuously improving supply chain management.

**Supplier Management and Assessment**
CSHK relies on suppliers to provide high-quality, sustainable products and services. To ensure that the suppliers and sub-contractors we use are compliant, honest, and in line with our sustainability concept, we have established our supply chain management system and continued to improve it. Supply chain management policies such as the Materials Procurement Procedures, Procurement Policy, and Supplier Code of Conduct have been formulated and regularly reviewed to make sure that supplier management procedures and materials procurement procedures are effectively followed.

<table>
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<tr>
<th>Development of Supplier List</th>
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<tbody>
<tr>
<td>• Suppliers of quality, safety and health, and environmental protection related materials should complete the Supplier Registration Form before being included in the supplier list</td>
</tr>
<tr>
<td>• Decide whether to include a supplier in the supplier list based on its capability, reputation, and past service performance</td>
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<tr>
<td>• Insist on &quot;centralised procurement&quot; and establish a list of approved suppliers to form long-term partnerships with suppliers, thus enhancing our competitiveness in the market</td>
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<tr>
<th>Supplier Assessment</th>
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<tr>
<td>• Insist on &quot;considering more choices&quot;, assessing the management and compliance management performances in terms of quality, environment, and health and safety when approaching new suppliers</td>
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<tr>
<td>• Potential suppliers are required to achieve satisfactory results before they can be included in the supplier list and start working with CSHK</td>
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<tr>
<th>Updating of Supplier List</th>
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<tr>
<td>• The Resource Department is responsible for conducting a comprehensive assessment of all suppliers on the supplier list each year, reviewing and updating the supplier list</td>
</tr>
<tr>
<td>• Based on the assessment results, unqualified suppliers will be removed from the list, and such suppliers will not be selected</td>
</tr>
<tr>
<td>• Any supplier that is once removed from the Supplier List must receive the approval of the General Manager of the Resource Department for reinstatement</td>
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<tr>
<th>Supplier Punishment</th>
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<tr>
<td>• Suppliers with poor performance shall be punished in accordance with the Supplier Disciplinary Review Form after taking into account the opinions of the construction site, engineering company or relevant departments, and shall be notified in writing</td>
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<tr>
<td>• Supplier performance subject to punishment: continuous failure to supply on time and in quality, failure to meet contractual obligations, breach of business ethics, breach of current statutory safety and environmental requirements resulting in prosecution against CSHK, etc.</td>
</tr>
<tr>
<td>• Suspended suppliers will only be considered for reinstatement after the period of discipline on the premise that the supplier has demonstrated its improvement, assurance measures, and monitoring approaches</td>
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<tr>
<th>Supplier Risk Assessment</th>
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<tr>
<td>• The Resource Department regularly evaluates and analyses risks such as prices of major materials, project requirements, and market supply and demand, compiles analysis reports and develops relevant follow-up and control measures, so as to ensure that suppliers can provide services and products that meet market expectations and standards</td>
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</table>
We have specified management issues regarding suppliers and sub-contractors in the Materials Procurement Work Procedures, the Construction Management, Inspection and Test Work Procedures, the Project Management Plan Preparation Guide, and other documents. For example, the receipt, inspection, testing and handling of non-conforming products of all our procured materials shall be handled in accordance with the Construction Management, Inspection and Test Work Procedures to ensure that the requirements of the project contracts are being met.

We have set out the code of conduct requirements for suppliers in the Supplier’s Code of Conduct, including:

- Comply with the laws and regulations of Hong Kong to provide quality services and products in accordance with the contract
- Comply with the policies of CSHK, including quality policy, safety and health policy, environmental policy, energy policy, etc.
- Fulfil social responsibilities, protect the rights and interests of employees and ensure equal opportunities, prohibit child labour or forced labour, emphasise a culture of integrity and uphold good business ethics such as fair trade and competition
- Manage and supervise upstream suppliers and manufacturers to ensure the quality and on-time delivery of goods

In addition, we visit our major suppliers to check their fulfilment of our requirements. We also conduct regular supervision and inspection on the use and management of site materials, ensuring that the procurement of materials is in line with the actual circumstances. We conduct annual satisfaction surveys with our major suppliers to understand their views about their cooperation with CSHK. We also survey the ESG performance of major suppliers to assess how they have been fulfilling sustainability and corporate social responsibility.

**Build a Green and Low-carbon Supply Chain**

To promote a sustainable supply chain, we have incorporated environmental and social responsibility considerations into our supplier selection and procurement procedures and activities. In addition, we have stated our requirements on green procurement in the Procurement Policy and Supplier’s Code of Conduct, prioritising procurement in close proximity and procurement of environmentally friendly materials, and ordering goods on demand, and in strict accordance with the quantity requested by construction sites and project needs, so as to reduce carbon emissions, save resources, and minimise the environmental impact of our supply chain. We encourage the green transition of suppliers and sub-contractors and will continue to provide sustainable supply chain training for our employees, suppliers and sub-contractors, and establish incentive mechanisms. Together with our supply chain partners, we look forward to developing the best low-carbon practices and driving the sustainable development of the supply chain.
Sustainable Supply Chain Performance in 2021

Proportion of local procurement: 98%

Proportion of FSC certified timber: 99.8%\(^4\)

Utilisation of renewable materials: 66,012 tonnes of reinforced steel bar with scrap steel content, accounting for approximately 23.3% of total reinforced steel bar used

Sustainable procurement expenditure: HKD 415 million

Green Procurement Measures in 2021

<table>
<thead>
<tr>
<th>Printer paper</th>
<th>Fully adopted 100% certified eco-friendly paper and recycled paper and encouraged projects to follow suit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plywood and eco-friendly square wood</td>
<td>Increased the proportion of certified eco-friendly plywood and square wood to 95%</td>
</tr>
<tr>
<td>Generator rental</td>
<td>Full adopted QPME certified generators and introduced generators with energy storage system during the Reporting Period, thus effectively reducing diesel consumption and boosting energy efficiency</td>
</tr>
<tr>
<td>Crane rental</td>
<td>Fully used European Style V cranes in service for less than 10 years</td>
</tr>
<tr>
<td>Office furniture</td>
<td>All office furniture made from E1 plates</td>
</tr>
<tr>
<td>Temporary lighting</td>
<td>Adopted LED lights for temporary lighting at all construction sites</td>
</tr>
</tbody>
</table>

\(^4\) Verified by the British Standards Institution (BSI)

Compliance with professional ethics

A fair and compliant business environment forms the cornerstone of steady corporate development and lays the foundation for companies, employees, clients, and partners to trust each other. Committed to ethical and honest business operation, CSHK implements high-standard corporate governance throughout the value chain. To foster a good corporate culture, we have formulated a number of policies and measures to regulate the integrity of our management personnel. For example, the responsible persons and key management personnel of all projects are required to sign the Project Integrity Commitment every year to promote a corporate culture of compliance and integrity in all projects.

In addition, to raise the awareness of integrity and honesty of all employees, we have set out in our Employee Handbook our code of ethics and discipline, including policies and standards regarding anti-corruption, anti-bribery, illegal gifting, conflict of interest, etc. All employees are subject to strict compliance with the aforementioned policies and standards, maintaining a professional, fair, and ethical attitude and behaviour towards customers and business partners in business dealings. We have established a mechanism for reporting misconducts to the Human Resources Department when employees detect suspicious behaviour. All information of whistle-blowers is treated confidentially to protect them from unfair dismissal or victimisation.

We believe that continuous training can enhance the understanding of ethical risks and good practices of our employees. Therefore, we organise anti-corruption training on a regular basis with a special focus on our industry. During the Reporting Period, we invited the Hong Kong Independent Commission Against Corruption (ICAC) to give our employees an online anti-corruption seminar, where our employees learned about corruption cases and corruption risks in the construction industry.
Creating Value
As a responsible corporate citizen, since our establishment in 1979, CSHK has been closely following and responding to the needs of the community through a variety of channels, actively exploring business models that maximise both business and social benefits. As we work on addressing challenges, we endeavour to capitalise the opportunities brought by sustainability concepts, so as to contribute solutions to local social and environmental problems with our expertise and create shared value for the community.
Integrating into Community and Creating Shared Value

With a keen focus on social issues, CSCI established the Volunteer Branch in June 2019 to fulfil corporate social responsibility utilising our expertise and human resources. As a member of CSCI, we uphold the purpose of “prosper Hong Kong, service society” and take on the mission of “managing happiness for society”, committed to serving the community and actively participating in charitable activities. We reach out to the community and offer services, in the hope of building a more harmonious, beautiful and liveable social environment together with stakeholders.

The Volunteer Branch has established the following “4+ x” volunteering system of “Care for the Elderly, Contribute Your Skills, Care for Teenagers, Care for Your Home + Innovative Space”, encouraging our employees to organise and participate in different types of volunteering services, taking action to address the service needs of the community and extending a helping hand to various groups.
Creating Value

During the Reporting Period, CSHK had more than 2,100 registered volunteers participated in more than 30 volunteer activities.

CSHK’s volunteer service hours reached 11,000 hours, volunteers reached 2,800 person-times.

Message from the Management

Sustainability Highlights

About CSHK

Sustainability Special Issue: Towards Carbon Neutrality

Flexibly carry out other volunteer activities, as well as volunteer activities initiated by employees.

Volunteer services mainly targeting house repair, city development, and environmental protection.

Volunteer services mainly targeting the elderly.

Volunteer services mainly targeting unemployed/disadvantaged/vulnerable groups.

Volunteer services mainly targeting teenagers.

“X” Innovation Space

Contribute Your Skills

Care for Teenagers

Care for the Elderly

Care for Your Home

4+X Volunteering System

Volunteer activities

Registered Volunteers

Volunteer Activities

Volunteer Hours

Volunteer Participation
Care for the Elderly
CSHK has a keen concern about the aging society. To express our care for the elderly, we visit elders living alone and in elderly homes, paying attention not only to their daily lives, but also to what they need.

The Volunteer Branch donated gift packages to the elders at Home for Elder in Kwai Chung to show our care and love. They also brought joy to the elders with exchange activities and talent shows. Subsequently, volunteers helped install safety handrails for the nursing home.

Contribute Your Skills
CSHK cares for disadvantaged groups in the community. During the Reporting Period, we continued to actively organise and participate in various volunteer activities, supporting groups in need.

In response to the “18 Districts Lo Pan Rice Campaign” co-sponsored by the Hong Kong Construction Association and the Construction Industry Sports & Volunteering Programme, CSHK set up three service teams to give Lo Pan Rice to over 200 grassroots citizens in July, spreading love to the community from the construction industry.
Care for Teenagers
Aspiring to unleash the potent of young people with our expertise and experience, we work with relevant organisations in active terms and provide a variety of learning opportunities to drive the growth and development of the younger generation.

Learning and Career Planning Guidance for Teenagers from Grassroots Families

CSHK has long been concerned about the development of young people, and actively drives volunteers to help young people from grassroots families learn and grow. During the Reporting Period, CSHK and non-profit-making organizations continued to organize a number of youth volunteers to provide study and career planning and academic guidance, as well as Mandarin, English, and mathematics tutoring for more than 20 young people from grassroots families.

Builders of the Future Hong Kong – Little Engineers Workshop

We invited more than 100 secondary school students in Hong Kong to visit the Hong Kong Palace Museum project, familiarising them with engineering projects and the daily work of engineers. At the same time, a visit to the MiC exhibition hall, the smart site cockpit, and the MR experience hall helped them learn about the latest construction technology and enhance their interests in the construction industry.
Care for Your Home
We are keen to understand the needs of different people in the community. Drawing on our expertise, we provide a variety of voluntary home repair services to residents in need, including disadvantaged grassroots families, subdivided housing households, and elders living alone, thereby contributing to a more pleasant living environment. Our Volunteer Branch has set up a house repairing team to carry out house maintenance work across Hong Kong, aiming at improving the living environment of citizens.

During the Reporting Period, we upgraded the “Hundred of Homes for Maintenance” Scheme to “Thousands of Homes for Maintenance” Scheme, with a view to offer all-round home maintenance services for more than 1,000 low-income families and elders living alone who are in need of such services, thus improving their living environment and safety at home.

Provided home maintenance services for **450 households**, engaging more than **250 volunteers**, contributing more than **1,480 volunteer service hours**

During the Reporting Period, we provided safety handrail installation, water pipe check, sink trap cleaning, TV cable check, pest control, and ceiling repair services for disadvantaged grassroots families, families living in subdivided housing, and elders living alone.
Innovative Space
In addition to the four service themes, we continue to expand the types of volunteer activities and service targets, actively participating in volunteer service events held by other organisations, in hopes of bringing positive changes to the community.

“COHL Charity Walk” Volunteer Programme

Under the theme of “green travel, environmental protection, public welfare”, the “COHL Charity Walk” programme encouraged employees, their families, and community members to form terms and pick up trash while hiking. Engaging people to protect the environment and serve the community with action, the programme spread positive energy for all.

Recognition and Honours
CSHK received awards from the Agency for Volunteer Service and the Construction Industry Council for our outstanding contributions and achievements in promoting volunteer services.

CSHK received the 9th Hong Kong Volunteer Award – Corporate Award (Group B) from the Agency for Volunteer Service

CSHK received two awards under the Construction Industry Sports and Volunteering Programme (CISVP) from the Construction Industry Council
About This Report

Reporting Period
This Report is the third annual Sustainability Report of CSHK, which summarises the sustainability performances of CSHK during the Reporting Period.

Reporting Scope
This report covers the main businesses of CSHK, including construction and engineering, investment, architectural technology products, and information technology. With the aim to demonstrate the sustainability performances of CSHK’s construction-related businesses, KPI data in this Report only includes the operation data of CSHK’s construction-related business, where the environmental data of jointly operated projects that are not led by CSHK (holding less than 50% of equity interests) are not included in this Report.

Basis of Reporting
This Report is prepared with reference to the Environmental, Social and Governance Reporting Guide of The Stock Exchange of Hong Kong Limited, the Global Reporting Initiative Standards (GRI Standards), the United Nations Sustainable Development Goals (UNSDGs), and the United Nations Global Compact (UN Global Compact) with a view to fully demonstrate to stakeholders the efforts and performance of CSHK in terms of sustainability.
Definitions

In this Report, unless the context otherwise requires, the following terms shall have the meanings set out below:

"Report" This Sustainability Report
"Reporting Period" The period from 1 January to 31 December 2021
"HKEX" Hong Kong Exchanges and Clearing Limited
"COHL" China Overseas Holdings Limited
"CSHK", "the Group" or "We" China State Construction Engineering (Hong Kong) Limited and its subsidiaries
"CSCI" China State Construction International Holdings Limited
"Building Company" China Overseas Building Construction Limited
"Civil Engineering Company" Chain State Civil Engineering Limited
"Mechanical and Electrical Engineering Company" China State Mechanical & Electrical Engineering Limited
"Foundation Company" China State Foundation Engineering Limited
"China State Construction Science and Technology" China State Construction Science and Technology Limited
"China State Construction International Medical Industry Development" China State Construction International Medical Industry Development Co. Limited
"O-PARK2" Hong Kong Organic Resources Recovery Centre Phase 2
"VER" Voluntary Emission Reduction
"VCS" Voluntary Carbon Standard
"FSC" Forest Stewardship Council
"BIM" Building Information Modelling
"DfMA" Design for Manufacture and Assembly
"MiC" Modular Integrated Construction
"VR" Virtual Reality
"AR" Artificial Reality
"DBO" Design-Build-Operate
"CIMS" Construction Information Management System
"Volunteer Branch" "Caring for Society" Volunteer Branch
"ESG" Environmental, Social and Governance
"Temporary Hospital" North Lantau Hospital Hong Kong Infection Control Centre
"AWE" AsiaWorld-Expo
"Mobile Cabin Hospital" Community Treatment Facility
## Summary of Key Performance Indicators

### Environmental Performance

#### Air Emissions

<table>
<thead>
<tr>
<th>Air pollutants</th>
<th>Emissions</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nitrogen oxides (NOx)</td>
<td>1,867.0</td>
<td>tonne</td>
</tr>
<tr>
<td>Sulphur oxides (SOx)</td>
<td>122.7</td>
<td>tonne</td>
</tr>
<tr>
<td>Respirable suspended particulates</td>
<td>131.2</td>
<td>tonne</td>
</tr>
</tbody>
</table>

#### Greenhouse Gas Emissions

<table>
<thead>
<tr>
<th>Scope</th>
<th>Source of emissions</th>
<th>Emissions</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scope 1: Direct emissions</td>
<td>Combustion of fossil fuels</td>
<td>73,110.8</td>
<td>tonne of CO2-e</td>
</tr>
<tr>
<td></td>
<td>GHG emissions from equipment and system operation</td>
<td>322.7</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Industrial production processes — welding</td>
<td>116.8</td>
<td></td>
</tr>
<tr>
<td>Scope 2: Energy indirect emissions</td>
<td>Purchased electricity</td>
<td>5,936.1</td>
<td>tonne of CO2-e</td>
</tr>
<tr>
<td>Total GHG emissions (Scope 1 &amp; 2)</td>
<td></td>
<td>79,486.4</td>
<td>tonne of CO2-e</td>
</tr>
<tr>
<td>Total GHG emissions (Scope 1 &amp; 2, by revenue)</td>
<td></td>
<td>3.3</td>
<td>tonne of CO2-e/ HKD million</td>
</tr>
<tr>
<td>Scope 3: Other indirect emissions</td>
<td>Industrial production process — welding (contractor)</td>
<td>2,093.4</td>
<td>tonne of CO2-e</td>
</tr>
<tr>
<td></td>
<td>Stationary combustion (contractor)</td>
<td>20,990.1</td>
<td>tonne of CO2-e</td>
</tr>
<tr>
<td></td>
<td>Disposal of waste paper</td>
<td>735.4</td>
<td>tonne of CO2-e</td>
</tr>
<tr>
<td></td>
<td>Water consumption</td>
<td>644.5</td>
<td>tonne of CO2-e</td>
</tr>
<tr>
<td></td>
<td>Sewage treatment</td>
<td>309.1</td>
<td>tonne of CO2-e</td>
</tr>
<tr>
<td></td>
<td>Air business travel</td>
<td>0</td>
<td>tonne of CO2-e</td>
</tr>
<tr>
<td>Total GHG emissions (Scope 1, 2 and 3)</td>
<td></td>
<td>104,259.0</td>
<td>tonne of CO2-e</td>
</tr>
<tr>
<td>GHG intensity (Scope 1, 2 and 3, by revenue)</td>
<td></td>
<td>4.4</td>
<td>tonne of CO2-e/ HKD million</td>
</tr>
</tbody>
</table>

---

5 The data of key performance indicators cover the operation data of CSHK’s construction-related business between 1 January to 31 December 2021, where the environmental data of jointly operated projects that are not led by CSHK (holding less than 50% of the equity interests) are not included in this Report.

6 The quantification process and emission factors referenced the Guidelines to Account for and Report on Greenhouse Gas Emissions and Removals for Buildings (Commercial, Residential or Institutional Purposes) in Hong Kong compiled by the Environmental Protection Department and the Electrical and Mechanical Services Department of Hong Kong, SME Carbon Audit Toolkit compiled by the University of Hong Kong and the City University of Hong Kong, and international standards such as ISO14064-1 and the GHG Protocol.
### Waste Generation

<table>
<thead>
<tr>
<th>Type</th>
<th>Generation</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hazardous waste generated</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total hazardous waste</td>
<td>15.8</td>
<td>tonne</td>
</tr>
<tr>
<td>Hazardous waste intensity (by revenue)</td>
<td>$6.6 \times 10^{-4}$</td>
<td>tonne/HKD million</td>
</tr>
<tr>
<td><strong>Non-hazardous waste produced</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Construction waste</td>
<td>1,093,175.7</td>
<td>tonne</td>
</tr>
<tr>
<td>Other non-hazardous waste</td>
<td>31,926.7</td>
<td>tonne</td>
</tr>
<tr>
<td>Total non-hazardous waste</td>
<td>1,125,102.4</td>
<td>tonne</td>
</tr>
<tr>
<td>Non-hazardous waste intensity (by revenue)</td>
<td>47.2</td>
<td>tonne/HKD million</td>
</tr>
</tbody>
</table>

### Use of Energy

<table>
<thead>
<tr>
<th>Type</th>
<th>Generation</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gasoline</td>
<td>6,570.8</td>
<td>MWh</td>
</tr>
<tr>
<td>Diesel</td>
<td>273,752.4</td>
<td>MWh</td>
</tr>
<tr>
<td>Acetylene</td>
<td>478.4</td>
<td>MWh</td>
</tr>
<tr>
<td>Purchased electricity</td>
<td>14,716.2</td>
<td>MWh</td>
</tr>
<tr>
<td><strong>Total energy consumption</strong></td>
<td>295,517.8</td>
<td>MWh</td>
</tr>
<tr>
<td>Energy intensity (by revenue)</td>
<td>12.4</td>
<td>MWh/HKD million</td>
</tr>
<tr>
<td>Renewable energy</td>
<td>2,955.2</td>
<td>MWh</td>
</tr>
</tbody>
</table>
# Use of Water and Discharge of Sewage

<table>
<thead>
<tr>
<th>Type</th>
<th>Consumption/Discharge</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Water consumption</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total water consumption</strong></td>
<td>1,545,568.1</td>
<td>cubic metre</td>
</tr>
<tr>
<td><strong>Water consumption intensity (by revenue)</strong></td>
<td>64.8</td>
<td>cubic metre/HKD million</td>
</tr>
<tr>
<td><strong>Sewage discharge</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Surface water (Direct discharge into natural water bodies (sea, rivers or lakes) after treatment in sewage treatment facility)</td>
<td>165,268.5</td>
<td>cubic metre</td>
</tr>
<tr>
<td>Discharge into stormwater drains after connecting with the municipal pipeline network</td>
<td>638,427.8</td>
<td>cubic metre</td>
</tr>
<tr>
<td>Discharge into communal sewers after connecting with the municipal pipeline network</td>
<td>2,906.0</td>
<td>cubic metre</td>
</tr>
<tr>
<td><strong>Total water discharge</strong></td>
<td>806,602.3</td>
<td>cubic metre</td>
</tr>
<tr>
<td><strong>Water discharge intensity (by revenue)</strong></td>
<td>33.8</td>
<td>cubic metre/HKD million</td>
</tr>
<tr>
<td><strong>Water reused</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total water reused</strong></td>
<td>49,036.8</td>
<td>cubic metre</td>
</tr>
</tbody>
</table>

7 Including fresh water supplied to contractors at construction sites by CSHK.

8 Including wastewater produced during construction at construction sites; relevant wastewater has been treated by on-site sewage treatment machines (settlement of suspended solids and neutralisation) and discharged into stormwater drains in accordance with standards and requirements stipulated in the sewage license.

9 The water was only reused in construction sites of CSHK, and was not used by other organisations.
### Use of Raw Materials

<table>
<thead>
<tr>
<th>Type</th>
<th>Consumption</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Supplied by CSHK</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Concrete</td>
<td>157,013.2</td>
<td>cubic metre</td>
</tr>
<tr>
<td>Cement mortar</td>
<td>9,928.8</td>
<td>cubic metre</td>
</tr>
<tr>
<td>Reinforced steel bar</td>
<td>75,362.5</td>
<td>tonne</td>
</tr>
<tr>
<td>Steel beams</td>
<td>1,351.1</td>
<td>tonne</td>
</tr>
<tr>
<td>Iron sheet piles</td>
<td>411.2</td>
<td>tonne</td>
</tr>
<tr>
<td>Cement</td>
<td>5,813.6</td>
<td>tonne</td>
</tr>
<tr>
<td>River sand</td>
<td>16,158.7</td>
<td>tonne</td>
</tr>
<tr>
<td>Stones</td>
<td>70,083.0</td>
<td>tonne</td>
</tr>
<tr>
<td>Bricks</td>
<td>9,286.5</td>
<td>tonne</td>
</tr>
<tr>
<td>Aluminium products</td>
<td>0.1</td>
<td>tonne</td>
</tr>
<tr>
<td>Steel products</td>
<td>37.7</td>
<td>tonne</td>
</tr>
<tr>
<td>Glass</td>
<td>7.4</td>
<td>tonne</td>
</tr>
<tr>
<td>Timber for packaging</td>
<td>14.6</td>
<td>tonne</td>
</tr>
<tr>
<td>Steel pipe</td>
<td>28.4</td>
<td>tonne</td>
</tr>
<tr>
<td>Other types of steel</td>
<td>180.7</td>
<td>tonne</td>
</tr>
<tr>
<td>FSC and PEFC certified timber purchased</td>
<td>7,360.1</td>
<td>tonne</td>
</tr>
<tr>
<td>Other timber purchased</td>
<td>14.6</td>
<td>tonne</td>
</tr>
<tr>
<td>Paper</td>
<td>153.2</td>
<td>tonne</td>
</tr>
</tbody>
</table>

### Use of packaging materials for finished products

<table>
<thead>
<tr>
<th>Category</th>
<th>Consumption</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total packaging materials</td>
<td>15</td>
<td>tonne</td>
</tr>
</tbody>
</table>
## Social Performance

### Employment

<table>
<thead>
<tr>
<th>Type</th>
<th>Gender</th>
<th>Number</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Current employees</strong></td>
<td>Male</td>
<td>4,250</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>1,159</td>
<td></td>
</tr>
<tr>
<td>Age group</td>
<td>30 or below</td>
<td>1,211</td>
<td></td>
</tr>
<tr>
<td></td>
<td>31–40</td>
<td>1,504</td>
<td></td>
</tr>
<tr>
<td></td>
<td>41–50</td>
<td>1,351</td>
<td></td>
</tr>
<tr>
<td></td>
<td>51 or above</td>
<td>1,343</td>
<td></td>
</tr>
<tr>
<td>Employment rank</td>
<td>Senior</td>
<td>13</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Middle</td>
<td>74</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Executive</td>
<td>451</td>
<td></td>
</tr>
<tr>
<td></td>
<td>General employees</td>
<td>4,871</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Number of new hires</strong></th>
<th>Gender</th>
<th>Number</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
<td>1,101</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>281</td>
<td></td>
</tr>
<tr>
<td>Age group</td>
<td>30 or below</td>
<td>593</td>
<td></td>
</tr>
<tr>
<td></td>
<td>31–40</td>
<td>429</td>
<td></td>
</tr>
<tr>
<td></td>
<td>41–50</td>
<td>206</td>
<td></td>
</tr>
<tr>
<td></td>
<td>51 or above</td>
<td>154</td>
<td></td>
</tr>
</tbody>
</table>

---

18 Total number of employees on 31 December 2021.
<table>
<thead>
<tr>
<th>Type</th>
<th>Number</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rate of new hires(^\text{11})</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>21</td>
<td></td>
</tr>
<tr>
<td>Age group</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30 or below</td>
<td>22</td>
<td>26%</td>
</tr>
<tr>
<td>31–40</td>
<td>28</td>
<td></td>
</tr>
<tr>
<td>41–50</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>51 or above</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Number of employee turnover</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>975</td>
<td>1,190</td>
</tr>
<tr>
<td>Female</td>
<td>215</td>
<td></td>
</tr>
<tr>
<td>Age group</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30 or below</td>
<td>454</td>
<td></td>
</tr>
<tr>
<td>31–40</td>
<td>376</td>
<td></td>
</tr>
<tr>
<td>41–50</td>
<td>188</td>
<td></td>
</tr>
<tr>
<td>51 or above</td>
<td>172</td>
<td></td>
</tr>
<tr>
<td>Rate of employee turnover(^\text{12})</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>18</td>
<td>22%</td>
</tr>
<tr>
<td>Female</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Age group</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30 or below</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>31–40</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>41–50</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>51 or above</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

\(^{11}\) Rate of new hires = (Number of new hires in 2021/Number of current employees on 31 December 2021) \times 100%.

\(^{12}\) Rate of employee turnover = (Number of employee turnover in 2021/Number of current employees on 31 December 2021) \times 100%.
## Health and Safety

<table>
<thead>
<tr>
<th></th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Employees</strong></td>
<td></td>
</tr>
<tr>
<td>Number of work-related injuries</td>
<td>3</td>
</tr>
<tr>
<td>Work-related rate per 1,000 persons</td>
<td>0.45</td>
</tr>
<tr>
<td>Number of work-related fatalities</td>
<td>0</td>
</tr>
<tr>
<td>Work-related fatality rate per 1,000 persons</td>
<td>0</td>
</tr>
<tr>
<td>Lost days due to work-related injury or occupational diseases</td>
<td>595</td>
</tr>
<tr>
<td>Lost day rate(^{14})</td>
<td>4.9</td>
</tr>
<tr>
<td>Absent days</td>
<td></td>
</tr>
<tr>
<td>Absentee rate(^{15})</td>
<td>0.029</td>
</tr>
<tr>
<td><strong>Other Workers(^{16})</strong></td>
<td></td>
</tr>
<tr>
<td>Number of work-related injuries(^{17})</td>
<td>46</td>
</tr>
<tr>
<td>Work-related rate per 1,000 persons</td>
<td>7</td>
</tr>
<tr>
<td>Number of work-related fatalities</td>
<td>0</td>
</tr>
<tr>
<td>Work-related fatality rate per 1,000 persons</td>
<td>0</td>
</tr>
<tr>
<td>Lost days due to work-related injury or occupational diseases</td>
<td>0</td>
</tr>
<tr>
<td>Lost day rate(^{18})</td>
<td>0</td>
</tr>
<tr>
<td>Absent days</td>
<td>10,113</td>
</tr>
<tr>
<td>Absentee rate(^{19})</td>
<td>0.5</td>
</tr>
</tbody>
</table>

\(^{13}\) There were no employee and other worker with occupational diseases in CSHK during the Reporting Period.

\(^{14}\) Lost day rate = (Total number of lost days/Original number of total working hours) \(\times\) 200,000; total number of working hours measured by 8 hours per working day.

\(^{15}\) Absentee rate = (Number of absent days/Original number of working days) \(\times\) 100%.

\(^{16}\) Including contractors/sub-contractors, volunteers, and other workers whose venue of work or work are managed by CSHK.

\(^{17}\) Including number of work-related fatalities.

\(^{18}\) Lost day rate = (Total number of lost days/Original number of total working hours) \(\times\) 200,000; total number of working hours measured by 8 hours per working day.

\(^{19}\) Absentee rate = (Number of absent days/Original number of working days) \(\times\) 100%.
### Training and Development

<table>
<thead>
<tr>
<th>Training percentage</th>
<th>Gender</th>
<th>Percentage</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
<td>82</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>63</td>
<td></td>
</tr>
<tr>
<td>Employment rank</td>
<td>Senior</td>
<td>62</td>
<td>78</td>
</tr>
<tr>
<td></td>
<td>Middle</td>
<td>78</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Executive</td>
<td>81</td>
<td></td>
</tr>
<tr>
<td></td>
<td>General employees</td>
<td>78</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Average training hours</th>
<th>Gender</th>
<th>Percentage</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
<td>6.1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>4.3</td>
<td></td>
</tr>
<tr>
<td>Employment rank</td>
<td>Senior</td>
<td>4.5</td>
<td>5.7</td>
</tr>
<tr>
<td></td>
<td>Middle</td>
<td>3.7</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Executive</td>
<td>6.6</td>
<td></td>
</tr>
<tr>
<td></td>
<td>General employees</td>
<td>5.7</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Percentage of employees who received performance review</th>
<th>Gender</th>
<th>Percentage</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
<td>67</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>47</td>
<td></td>
</tr>
<tr>
<td>Employment rank</td>
<td>Senior</td>
<td>100</td>
<td>62</td>
</tr>
<tr>
<td></td>
<td>Middle</td>
<td>95</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Executive</td>
<td>94</td>
<td></td>
</tr>
<tr>
<td></td>
<td>General employees</td>
<td>59</td>
<td></td>
</tr>
</tbody>
</table>

### Supply Chain Management

<table>
<thead>
<tr>
<th>Number of suppliers</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>540</td>
</tr>
</tbody>
</table>

### Community Investment

<table>
<thead>
<tr>
<th>Number of suppliers</th>
<th>Number</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>351,672</td>
<td>HKD</td>
</tr>
<tr>
<td></td>
<td>2,814</td>
<td>person times</td>
</tr>
<tr>
<td></td>
<td>11,063</td>
<td>hour</td>
</tr>
</tbody>
</table>

---

20 Including data of resigned employees who have received training during the Reporting Period.

21 CSHK applies the same practice of hiring, managing and monitoring suppliers to all suppliers under the same category to ensure the fairness of supplier management systems.
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