



企业简介 Company Overview

中建科工 (CHINA CONSTRUCTION SCIENCE AND INDUSTRY CO., LTD.)

中建钢构 (CHINA CONSTRUCTION STEEL STRUCTURE CO., LTD.))

隶属于

中國建築取份有限公司 (全球最大投资建设集团,世界500强第13位)

Affiliated to CHINA STATE CONSTRUCTION ENGRG CORP LTD.

(The world's largest investment and construction group, ranked 9th in the world's top 500)

中国最大的钢结构产业集团 (The Largest Steel Structure Industry Group in China)

国家高新技术企业(National High-Tech Enterprise)



企业简介 Company Overview



- ◆ Five modern steel structure fabrication plant with annual production capacity exceed 1.2 million tons in mainland China. Also set the plant in Dubai and Algeria, and the Egypt plant will open next year.
- ◆ Ranking first in the structure steel industry for ten consecutive years in China.
- ◆ Plant have passed the verification of European standard, American standard and Japanese standard.



Why MiC

Construction Industry in Hong Kong

The construction industry is a vital sector in the economy of Hong Kong, employing almost half a million workers. Based on the forecast by the Construction Industry Council in December 2017, annual construction expenditure will exceed \$250 billion, or approximately 5% of GDP, within the next 5 years. The construction industry has an essential bearing on the economic growth and long-term development of Hong Kong, and the livelihood of its people. However, it is facing some challenges in recent years:

- Shortage and ageing of the labour force affecting productivity
- High construction cost
- Demands for better safety, quality, and environmental friendliness in construction

The situation will become worse in the next few years as the demand for construction services continues to rise. It is time to find ways to enhance productivity for the construction industry's future.

◆ we believe that MIC is the direction of the future, based on almost 40 years experience in the field of structure steel, and the company began to deploy STEEL MIC business in 2020.



聚焦两大产品方向 Focus on two major product directions

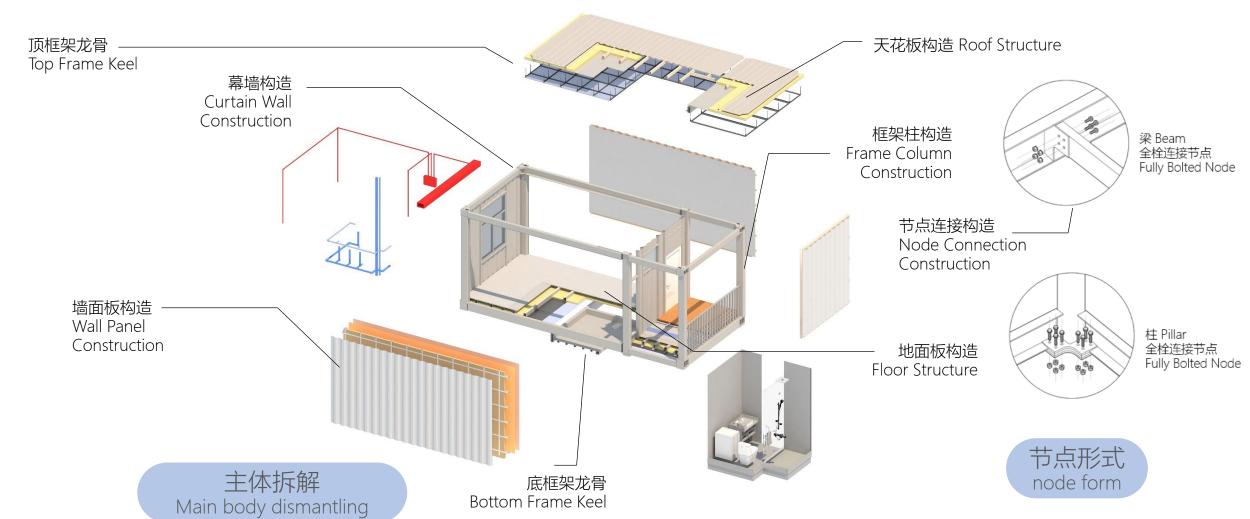






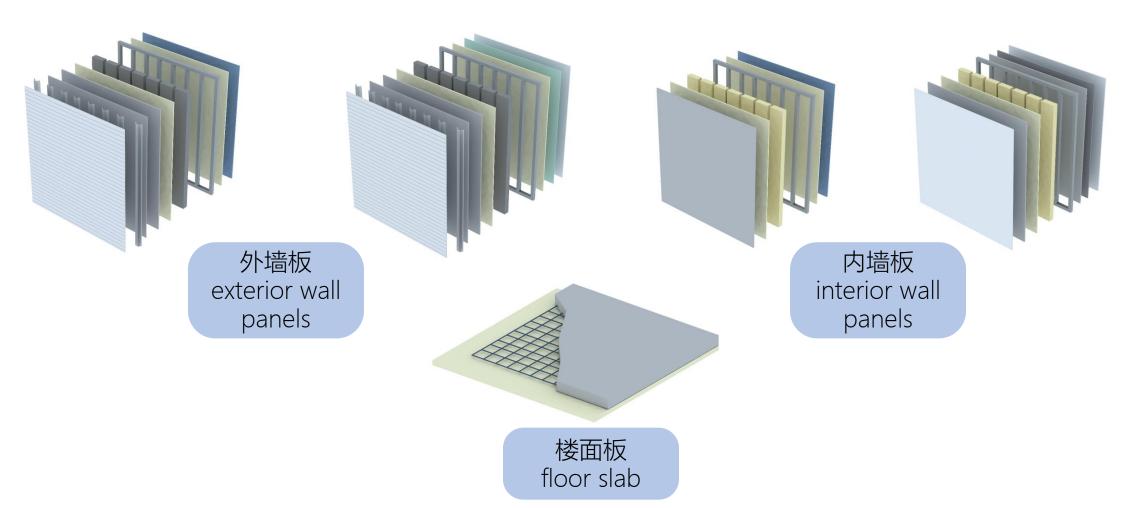
成熟技术体系 Mature technology system

• 以钢结构框架为主体,定位为永久性建筑 (With the <mark>steel structure frame</mark> as the main body, positioning as a permanent building).



成熟技术体系 Mature technology system

• 集成墙板和装修,适配市场绝大部分建材,选择丰富度较高,完成后与传统建筑体验一致 (Integrated wall panels and decoration, suitable for most building materials in the market, rich in choice, consistent with traditional building experience after completion)

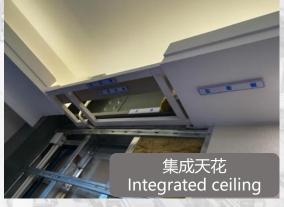


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Integrated bathroom

传统装修 Traditional decoration

装配式集成化装修 Prefabricated integrated decoration







分阶段 实现自动化 Automate in phases

全自动 Fully Automatic



材料阶段 material stage

全自动

Fully Automatic



结构阶段 structural stage

半自动

semi-automatic



装潢阶段 decoration stage



产品化 Commercialized

端链贯通,全阶部署升级交付形态

End-to-end chain connection, full-stage deployment and upgrade delivery form

打通制造的全阶段、全要素,从材料到构件,从构件到完整产品,生产能力部署覆盖结构、装修、机电、幕墙等专业和阶段,真正实现**拎包入住、到手即用**的成品交付形态

Get through all stages and elements of manufacturing, from materials to components, from components to complete products, production capacity deployment covers structure, decoration, electromechanical, curtain wall and other specialties and stages, and truly realize the ready-to-use finished product delivery form





行业首家以**非标(特箱)**自动化工程装备设计理念研发设计模块化生产线,大量采用高精度伺服、丝杆等结构及一键联动控制程序,整体效率提升50%以上

The first in the industry to develop and design a modular production line based on the design concept of non-standard (high cubic container) automation engineering equipment. A large number of high-precision servos, screw rods and other structures and one-key linkage control programs are used, and the overall efficiency is increased by more than 50%.

制造精度行业领先:

Industry-leading manufacturing precision

● 长宽高误差 0~-2mm;

Length, width and height error 0~-2mm

对角线绝对值 0~5mm;

Diagonal absolute value 0~5mm

生产效率行业领先:

Industry-leading production efficiency

• 结构效率是传统特箱生产线的1.5-2.0倍;

The structural efficiency is 1.5-2.0 times that of the traditional high cubic container production line

● 油漆单工位出箱效率是传统的5倍(烘房出箱节拍45-60min/台);

The box-out efficiency of the paint single station is 5 times that of the traditional one (the box-out cycle of the drying room is 45-60min/unit)



装配自动化 Assembly automation



物流自动化 Logistics automation



焊接自动化 Welding automation



柔性化 Flexibility

高宽容度,弹性适配释放设备潜力 High tolerance, elastic adaptation to release the potential of equipment

)规格弹性大:长度、宽度、高度三向空间可变,覆盖**主流市场85%**以上产品规格尺寸

Large specification flexibility: length, width and height are variable in three directions, covering more than 85% of the mainstream market product specifications and sizes

● 长度: 6m-16m; Length:6m-16m

● 宽度:2400-4200mm;Width: 2400-4200mm

● 高度可变最大4200mm; Variable height up to 4200mm

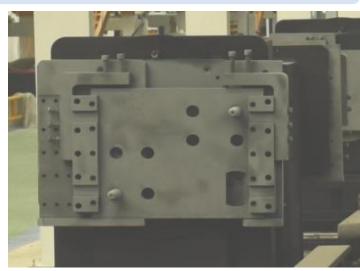
柔性工装设置 Flexible Tooling Setup



产线宽度自动调节 Automatic adjustment of production line width



装配柔性夹具 Assembling the flexible fixture



角柱万能柔性夹具 Corner column universal flexible fixture

智能化 Intelligent

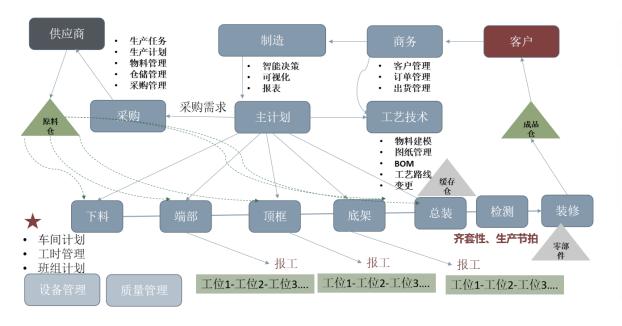
信息加持,一体化平台支撑管理决策

Information blessing, integrated platform supports management decision-making

管理智能化:依托MES全生命周期信息化管理平台,实现箱体从加工制造到现场安装**全过程管理数据化、**可视化,订单、制造、能源管理系统协同互融

Intelligent management: Relying on the MES full life cycle information management platform, realize the digitalization and visualization of the whole process management of the cabinet from processing and manufacturing to on-site installation, and coordinate and integrate order, manufacturing and energy management systems

- 订单 信息化管理-Order information management
- 制造 全生命周期管理- Manufacturing Full Lifecycle Management
- 能源 能像系统应用-Energy Energy Type Image System Application







智能化 Intelligent

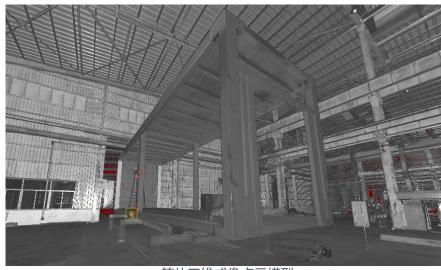
技术赋能,三维点云提升交付品质 Technology empowerment, 3D point cloud improves delivery quality

质检智能化:品控创新试用高精度三维激光扫描仪,实现总装箱体尺寸**分米级检测,零接触作业**

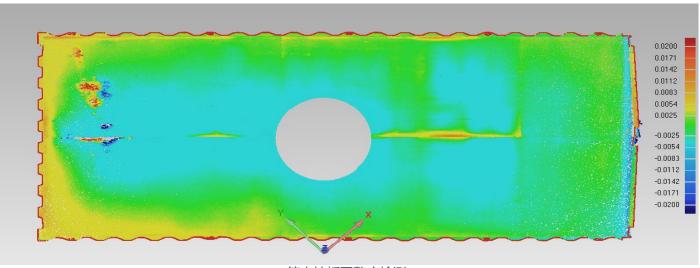
100%消除登高安全风险,效率提高至300%以上

Intelligent quality inspection: Quality control innovations use high-precision 3D laser scanners to achieve decimeter-level detection of final assembly box sizes, zero-touch operations 100% eliminate safety risks in climbing, and efficiency increases to more than 300%

- 8000万像素全景影像,扫描速度100万个点/秒; 80 million pixel panoramic image, scanning speed 1 million dots/second
- 生成总体 < 1mm一个点采样间隔的高密度点云; Generate a high-density point cloud with a point sampling interval of less than 1mm
- 100%避免了人员登高拉尺测量的安全风险; 100% avoid the safety risk of people climbing up and drawing a ruler to measure
- 测量精度 < 1mm; Measurement accuracy < 1mm
- 测量时间3-5min/台箱; Measuring time 3-5min/box



稍体二维成像点云模型 Box 3D imaging point cloud model



箱内地板平整度检测 Flatness detection of the floor in the box

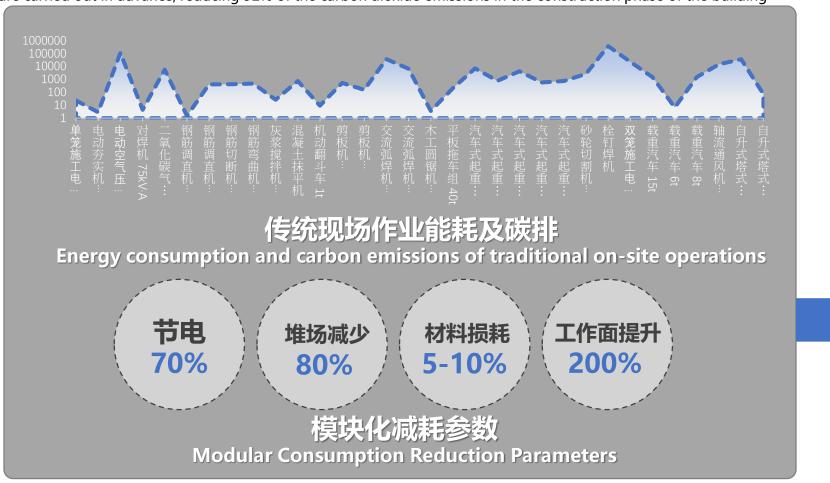
减排化 Emission Reduction

作业前置,全工厂制造促减排降碳

Pre-operation, whole factory manufacturing promotes emission reduction and carbon reduction

减排降碳: 预制装配率高达95%,使现场施工作业绝大部分前置,降低92%的建筑建造阶段二氧化碳排碳量

Emission reduction and carbon reduction: The prefabricated assembly rate of modular buildings is as high as 95%, so that most of the on-site construction operations are carried out in advance, reducing 92% of the carbon dioxide emissions in the construction phase of the building





现场工作

箱体拼装及接缝处理

工厂前置工作

龙针	号安装	辅材下料	涂料喷泡
切村	反装板	钻孔切割	岩棉固定
打钩	汀粘胶	吊顶安装	墙体安装

有产品、有体系、有产线,技术的成熟最终归于

中建科工MIC项目实践

There are products, systems, and production lines, and the maturity of technology is ultimately attributed to the practice of the MIC project of CCSIC









项目概况 Project Overview





项目展示 Project display



工厂加工照片 Factory processing photos



现场吊装照片 On-site hoisting photos



工厂完工照片 Completed photos of the factory



主体完工照片 Main finished photo



软装陈设照片 Soft Furnishing Photos



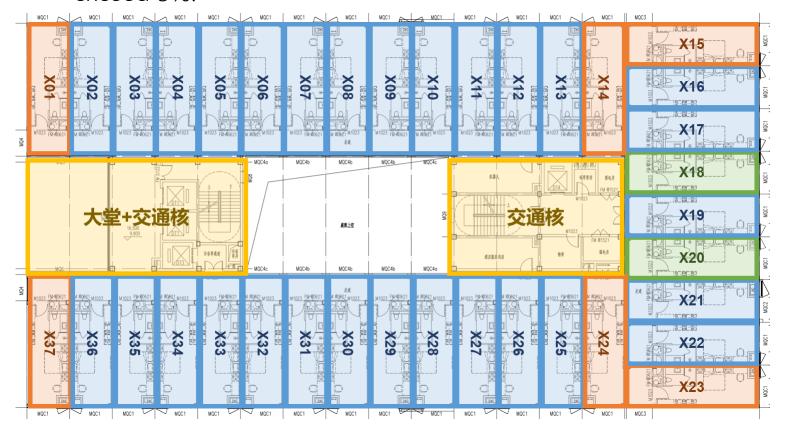
投入使用照片 Put into use photo





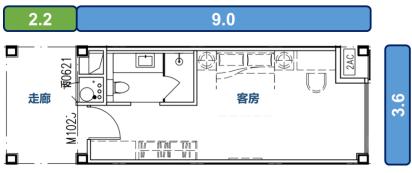
建筑标准化 Building Standardization

- A1-A4栋酒店均采用箱框体系,A5栋为纯模块叠箱体系,无交通核,模块合计1288台箱。(国内最大)
- 标准模块占比80%,剩余20%模块变化率不超过5%
- The hotels in buildings A1-A4 all adopt box-and-frame system, and building A5 is a pure modular stacking system without traffic cores, with a total of 1,288 boxes. (the largest in China)
- Standard modules account for 80%, and the change rate of the remaining 20% modules does not exceed 5%.



29台标准箱 29 TEUs

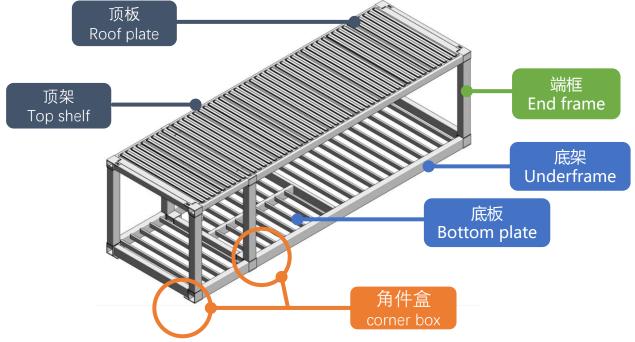
- 6台山墙箱 (带斜撑) 6 gable boxes (with diagonal braces)
- 2台特殊箱 (少柱) 2 special boxes (less columns)



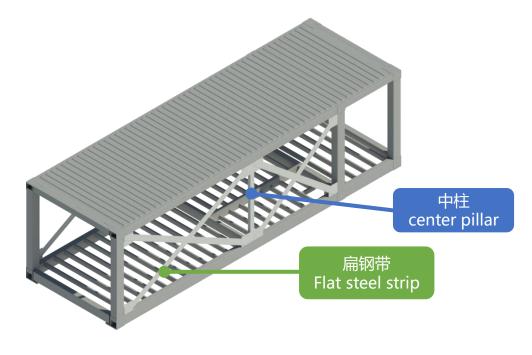


结构标准化 Structural standardization

- 标准结构箱包含角件盒12个、端框3组、顶架2组、底架2组、顶板1块(波纹板)、底板1块(镀锌板);
- 标准箱型构件规格外轮廓、角件节点<mark>基本一致</mark>,随建筑高度方向,主要调整板材<mark>壁厚</mark>;
- 装修、机电设计几乎不受结构变化影响
- The standard structural box includes 12 corner boxes, 3 sets of end frames, 2 sets of top frames, 2 sets of bottom frames, 1 piece of top plate (corrugated plate), 1 piece of bottom plate (galvanized plate);
- Standard box-shaped components have basically the same specification outline and corner joints, and the wall thickness of the plate is mainly adjusted along with the height of the building;
- Decoration, mechanical and electrical design is hardly affected by structural changes



A3、A4栋标准结构箱 A3, A4 building standard structure box



A1、A2、A5栋标准结构箱 A1, A2, A5 building standard structure box



装饰装修标准化 Decoration standardization

深圳会展国际酒店

- 幕墙全部采用单元式幕墙,箱体部分的在工厂预装,规格完全一致*
- 现场收口部分铝板,模数相同

- The curtain walls are all unitized curtain walls, and the box part is preinstalled in the factory, and the specifications are exactly the same
- The aluminum plate of the on-site closing part has the same modulus





装饰装修标准化 Decoration standardization

- 内装基层、面层材料(墙面、天花)标准模数全部为600mm, (地板)标准模数为410mm
- The standard modulus of interior base and surface materials (wall, ceiling) is 600mm, and (floor) standard modulus is 410mm



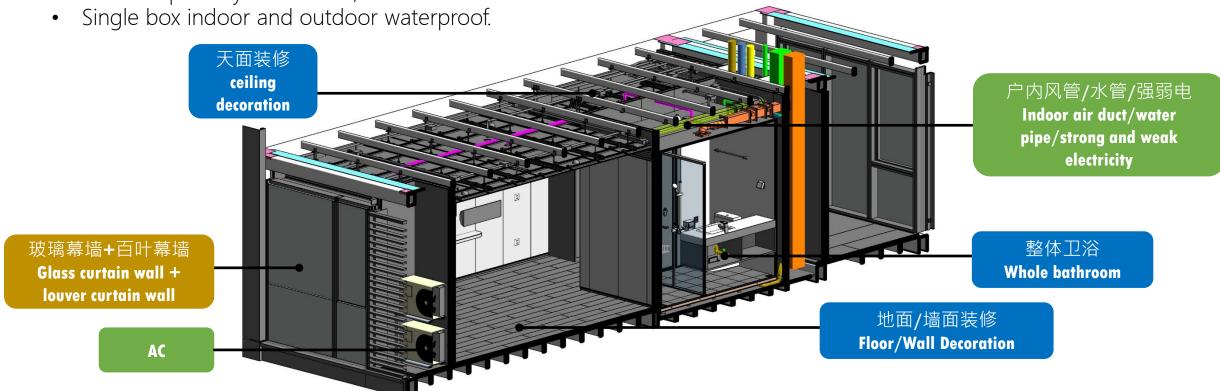






全专业集成 Full professional integration

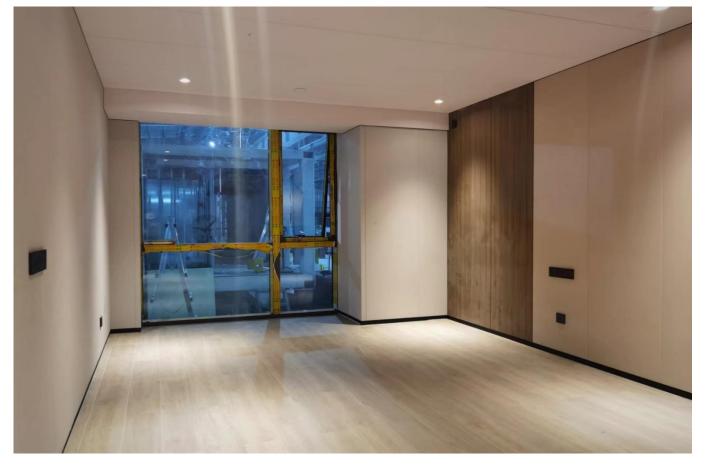
- 房间内机电系统、室内装修、整体卫浴、幕墙单元板块;
- 走廊基层装修;
- 单箱室内外防水。
- In-room MEP system, interior decoration, overall bathroom, curtain wall unit plate;
- Corridor primary decoration;





全预制交付 Fully prefabricated delivery

- 客房模块完成全部的结构、机电、装修等专业施工,包括热水器、空调、新风、智能化等设备,达到 包入住的标准
- The guest room module completes all professional construction such as structure, electromechanical, and decoration, including water heaters, air conditioners, fresh air, intelligent equipment, etc., to meet the standard of fully furnished



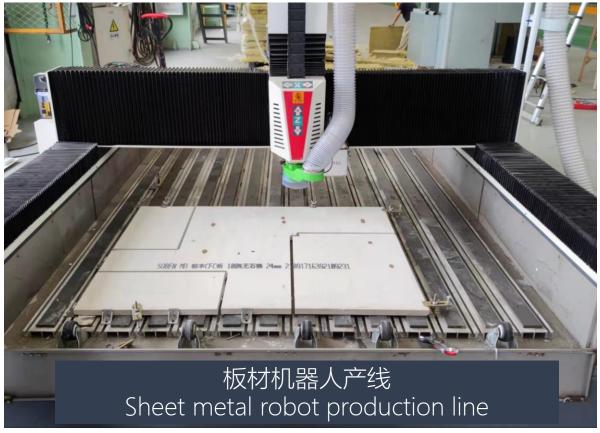
客房内全部完成 Complete in room



机器人制造 Robot manufacturing

- 主体结构(钢结构) 生产采用自动化产线制造,墙板、轻钢龙骨等部品由智能化机器人制造并预拼完成
- The main structure (steel structure) is manufactured by the automation production line, and parts such as wall panels and light steel keels are manufactured by intelligent robots and pre-assembled







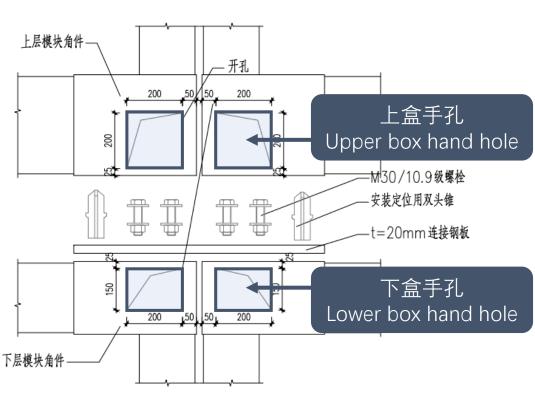


全螺栓连接 Full Bolted Connection

- 模块箱体之间连接以角件盒作为核心构件,全部采用高强螺栓连接,无需焊接和灌浆,加速现场安装效率
- The corner box is used as the core component for the connection between the module boxes, all of which are connected by high-strength bolts, without welding and grouting, which speeds up the efficiency of on-site installation









层间连接(MM) Inter-layer connection



全干式工法 Full-dry method

- 模块箱体的墙面、地面、天面均采用波纹板、水泥纤维板+轻钢龙骨复合构造,**无混凝土浇筑。**
- The wall, floor and sky of the module box are all made of corrugated board, cement fiber board + light steel keel composite structure, without concrete pouring.



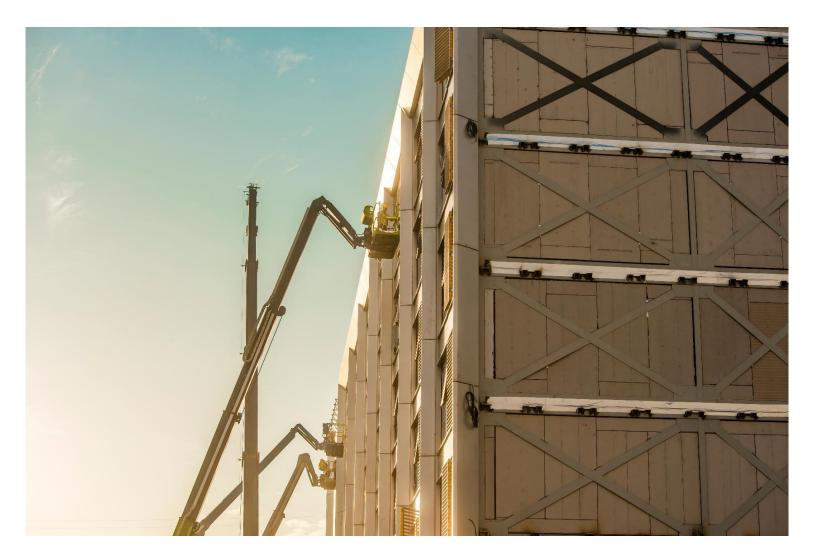


轻钢龙骨复合墙体地面预拼,整体安装 Light steel keel composite wall and ground pre-assembled, overall installation



全机械安装 Full mechanical installation

- 现场无外架设置、全部采用履带吊、举升车完成吊装、安装作业
- There is no external frame setting on site, and all the hoisting and installation operations are completed by crawler cranes and lift trucks







一体化卫浴 Integrated bathroom

- 标准客房100%采用整体卫浴;
- 采用预贴瓷砖的一体式底盘,以及金属一体式的墙板
- 100% of the standard rooms adopt the whole bathroom
- One-piece chassis with **pre-tiled tiles**, and metal one-piece wall panels



瓷砖预铺贴底盘 Tile pre-paved chassis



整体卫浴金属一体板 Whole bathroom metal integrated panel



一体化面板 Integrated panel

深圳会展国际酒店

- 墙饰面板为竹木纤维板+膜印技术,可以实现金属、瓷砖、布纹等复合纹理
- 天花采用复合蜂窝铝板, 替代传统的涂料或湿贴工艺
- 地面全部为SPC石塑地板,安装效率高,平整度好
- · 加快施工效率,减少TVOC等污染物释放

- The wall decoration panel is made of bamboo fiberboard + film printing technology, which can realize composite textures such as metal, ceramic tile, and cloth pattern
- The ceiling is made of composite honeycomb aluminum panels, replacing the traditional paint or wet pasting process
- The ground is all SPC stone-plastic floor, with high installation efficiency and good flatness
- Accelerate construction efficiency and reduce the release of pollutants such as TVOC



墙面-竹木纤维板 Wall-Bamboo fiberboard



天花-蜂窝铝板 Ceiling-Honeycomb Aluminum Panel



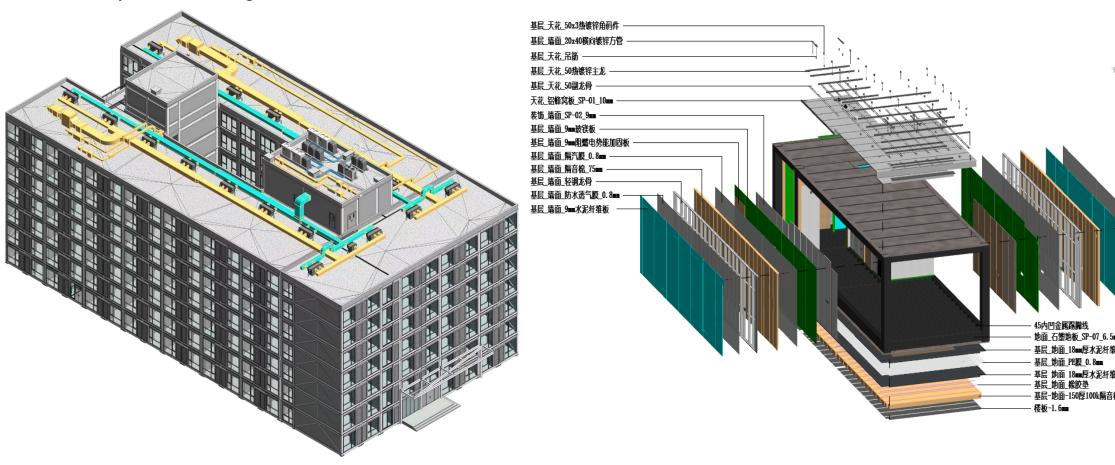
地面-SPC地板 Ground-SPC floor





高精度BIM High-precision BIM

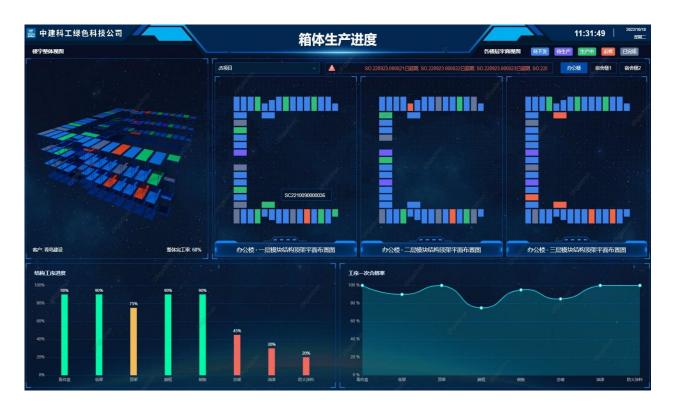
- 项目的BIM全专业模型深度达LOD400,精准至螺丝级,有效地指导工厂制造和现场安装
- The BIM full-professional model of the project has a depth of LOD400 and is accurate to the screw level, effectively guiding factory manufacturing and on-site installation





数字化平台 Digital platform

- 现场的<mark>数字孪生可视化系统</mark>与后台<mark>MES生产管理系统</mark>相协同,通过二维码进行全流程管理管理,对工厂 制造以及现场安装进行实时的信息采集分析,为项目决策提供依据
- The on-site digital twin visualization system is coordinated with the background MES production management system, and the whole process management is carried out through the QR code, and the real-time information collection and analysis of factory manufacturing and on-site installation are carried out to provide a basis for project decision-making



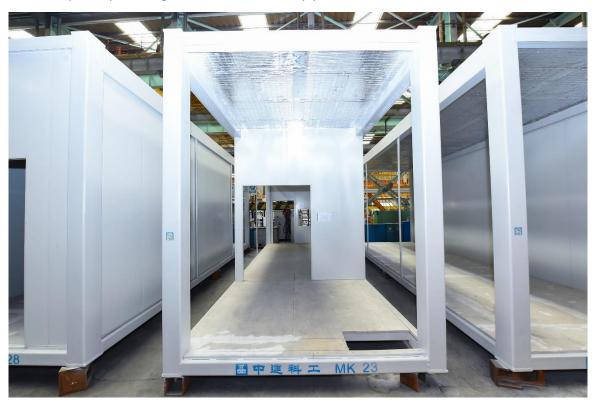






落馬洲河套項目 Lok Ma Chau Loop Project

- 应急医院中的部分设备房(如CT室、MRI室等)因承载要求较大,单位面积承载要求为3KN和8KN。若 采用传统打包箱无法满足,故选用钢结构模块(MIC,轻型)进行施工。
- (案例)单个医疗单元应用36个模块,尺寸为9000mm*2990mm*3700mm(长*宽*高)。
- Some equipment rooms in emergency hospitals (such as CT rooms, MRI rooms, etc.) have relatively large load-bearing requirements, and the load-bearing requirements per unit area are 3KN and 8KN. If the traditional packing box is not enough, the steel structure module (MIC, light) is selected for construction.
- (Case) A single medical unit applies 36 modules, with a size of 9000mm*2990mm*3700mm (length*width*height).







落馬洲河套項目 Lok Ma Chau Loop Project

放射科及检验科单元 (案例)

Department of Radiology and Laboratory Unit (Case)





落馬洲河套項目 Lok Ma Chau Loop Project

- 3月6日~3月14日,36台箱体生产周期为9天。
- 模块化箱体单箱重量约为7t, 现场吊装工期为1.5天, 平均30min/台, 箱顶防水及收边收口作业时间2天。
- From 6th March to 14th March, the production cycle of 36 cabinets is 9 days.

• The weight of a single modular box is about 7t. The on-site hoisting period is 1.5 days, with an average of 30 minutes per unit. The









项目概况 Project Overview

- 模块化数据中心 (MODULAR IDC),已承建2个项目,模块箱体共404个。(包含供电、电池、设备、 交通等模块)
- Modular data center (MODULAR IDC), has undertaken 2 projects, with a total of 404 modular boxes. (Including power supply, battery, equipment, transportation and other modules)



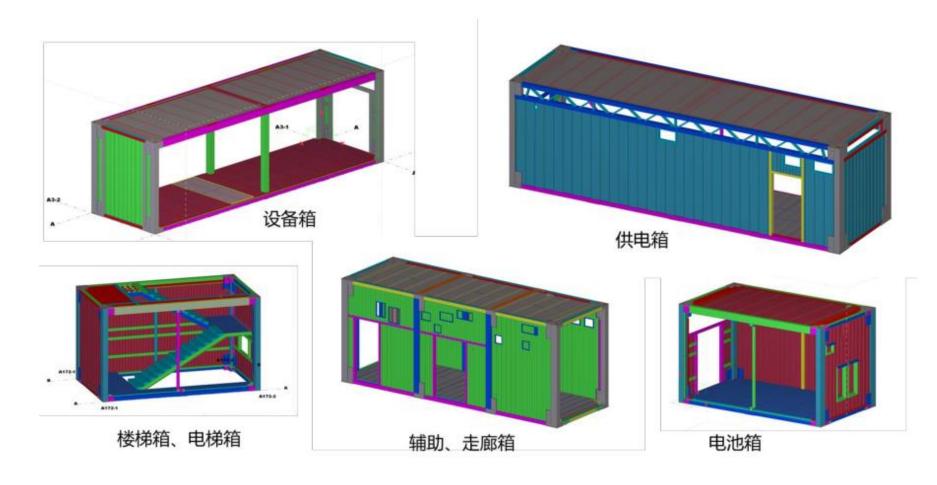
1) 层数 Storey:

- 地上5层 5 floors above ground
- 2) 箱体数量 Cabinet Quantity:
- 252个箱体+126楼板+60端墙
- 3) 最大尺寸 Maximum size
- 12192mm×3495mm×4150mm
- 4) 单箱重量 Weight of single box
- 单个箱体重量约15.16吨



项目概况 Project Overview

- 与传统建筑不同,以不同设备功能对模块进行区分和分类设计
- 箱体保持相同模数
- Different from traditional buildings, modules are distinguished and classified according to different functions
- The box remains the same modulus

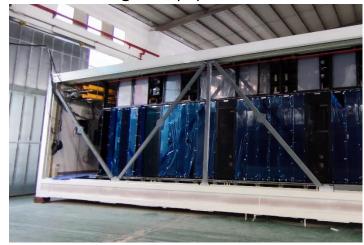




生产制造展示 Manufacturing display



设备箱结构制作 Manufacturing of equipment box structure



设备安装 Device installation



设备箱成品制作 Production of finished equipment boxes



现场成品照片 On-site finished photos



设备安装 Device installation





香港项目案例 Hong Kong Project Cases

1.Hong Kong International Airport Skybridge



Project Name: Hong Kong International

Airport Skybridge

Location: Hong Kong

Steel Tonnage: 6,000 tons

Span:160m

Material: S460

Max. steel thickness: 120mm

Work Scope: Design, supply, Fabrication,

assembly of structural steelworks

Period:2018-2019

2. Hong Kong International Commerce Center



Project Name: Hong Kong

International Commerce Center

Location: Hong Kong

Total Floor Area: 510,900sqm

Height: 490m, 118-storey

Steel Tonnage: 32,000 tons

Work Scope: Erection of structural

steelworks

Period:2006-2008

3. West Kowloon Xiqu Center



Project Name: West Kowloon Xiqu Center

Location: Hong Kong

Steel Tonnage: 6,500 tons

Material: S460

Max. steel thickness: 100mm

Work Scope: Design, supply, fabrication, assembly, delivery to site, and heavy

lifting of structural steelworks

Period:2015-2016



香港项目案例

4. Ngong Shuen Chau Exhibition Center



Project Name: Ngong Shuen Chau

Exhibition Center

Location: Hong Kong

Steel Tonnage:3000MT

Work Scope: Design, supply,

fabrication, delivery to site and

erection of structural steelworks

Period:2018-2019

5. Kai Tak Sports Park Main Stadium



Project Name: Kai Tak Sports Park Main

Stadium

Location: Hong Kong

Steel Tonnage: 20,000 tons

Material: S460

Max. steel thickness: 80mm

Work Scope: Design, supply, fabrication,

assembly ,delivery to site and heavy

lifting of structural steelworks

Period:2019-present

6. Shek Kwu Chau Integrated Waste Management Facilities



Project name: HKIWMF

Location: Hong Kong

SteeTonnage:22,000MT

Work Scope: Design and Fabrication of

structural steelworks

Period:2019-present



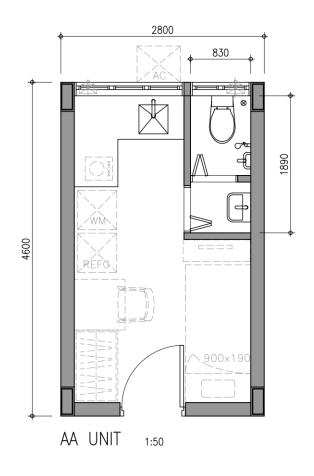
简约公屋计划 Simple public housing scheme

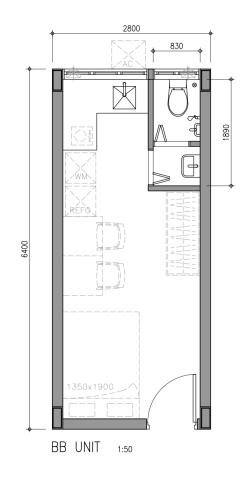
场地	总单元	总MiC模块	楼宇组合(面积详见图纸)				路程距离 - (从HZMB HKP*	建筑宣庆/排尺	MiC模块暂定交付时间	
			AA单元 (4600×2800) (mm)	BB单元 (6400×2800) (mm)	CC单元 (4600×2800) (mm)	DD单元 (6400×2800) (mm)) (WHZMR HKL	建筑高度/楼层	起始时间	交付时间
工包1										
总共:	11500	15170	2360	5470	2290	1380	2.5个月			
场地A	1110	1300	190	730	190	-		3层	2024.4	2024.6
							40km	16层,位于地下原址层顶部-	5.5个月	
第一阶段	2060	2490	830	800	300	130			2024.10	2025.5
场地B									12.5个月	
第二阶段	8330	11380	1340	3940	1800	1250			2024.10	2025.12
工包2	10000	14210	2200	F100	2420	1200	I			
总共:	10800	14210	2290	5100	2120	1290	5个月			
场地C	2110	2480	370	1370	370	-	30km	3层	2024.9	2025.2
场地D									6.51	月
第一阶段	2300	3100	900	600	410	390	20km		2025.3	2025.9
场地D	2980	4050	200	1710	690	380	ZUKIII	10层,位于地下冰型层坝即	8.51	月
第二阶段	2900	4030	200	1710	690	300			2025.6	2026.2
								18层,位于地下原址层顶部	4个月	
场地E	1850	2340	500	860	290	200	20km		2025.3	2025.7
场地F	1560	2240	320	560	360	320	45km	18层,位于地下原址层顶部	4个月	
									2025.3	2025.7
工包3										
总共:	7700	9240	1540	4620	1540	-				
场地G 第一阶段	3500	4200	700	2100	700	-	- 20km	18层,位于地下原址层顶部	8个 2025.5	月 2026.1
75 17174										
场地G 第二阶段	4200	5040	840	2520	840	-		16层,位于地下原址层顶部	9.5 ↑ 2025.5	·月 2026.2

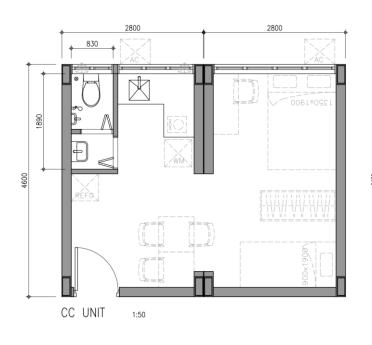


简约公屋计划 Simple public housing scheme

AA单元: 4600mm×2800mm BB单元: 6400mm×2800mm CC单元: 4600mm×2800mm DD单元: 6400mm×2800mm











简约公屋计划 Simple public housing scheme



YOUR REF 來函檔號 OUR REF 本署檔號: FAX 圖文傳真:

2523 9380 3842 3052 www.bd.gov.hk

(17) in BD/MiC/220502

20 June 2022

China Construction Science and Industry Corporation Ltd. (Attn: Mr. Jiao Bin) Unit 2001-04, 20th floor, 9 Chong Yip Street, Kwun Tong, Kowloon Hong Kong

Dear Sir/Madam.

Letter of In-principle Acceptance (Acceptance Reference No.: MiC 9/2022)

This letter is issued to China Construction Science and Industry Corporation Ltd. to confirm that the Modular Integrated Construction (MiC) system (Model No. CCSIC-MIC-HK-S6-1) as submitted to the Buildings Department (BD) is acceptable in principle for use in private building projects in Hong Kong in respect of the performance aspects listed in Appendix I, subject to the following conditions:

- (i) The design and construction of any building project adopting the above MiC system shall comply with the provisions of the Buildings Ordinance (BO) and its subsidiary legislations;
- (ii) The conditions as set out in Appendix II and Appendix III shall be
- (iii) The modular units of the above MiC system shall be fabricated in the factories listed in Appendix IV with a valid ISO 9001 or equivalent quality assurance certification; and
- (iv) This in-principle acceptance (IPA) is subject to a validity period expiring on 20 June 2027.

General information of the MiC System (Model No. CCSIC-MIC-HK-S6-1) submitted by China Construction Science and Industry Corporation Ltd. is available on BD's website.

/This ...

- 目前公司已取得6层IPA许可,30层IPA许可也即将落地。
- 中建科工已为香港市场,做好了准备。
- At present, the company has obtained the 6-layer IPA license, and the 30-layer IPA license is about to land.
- CCSIC is ready for the Hong Kong market.



中建科工

