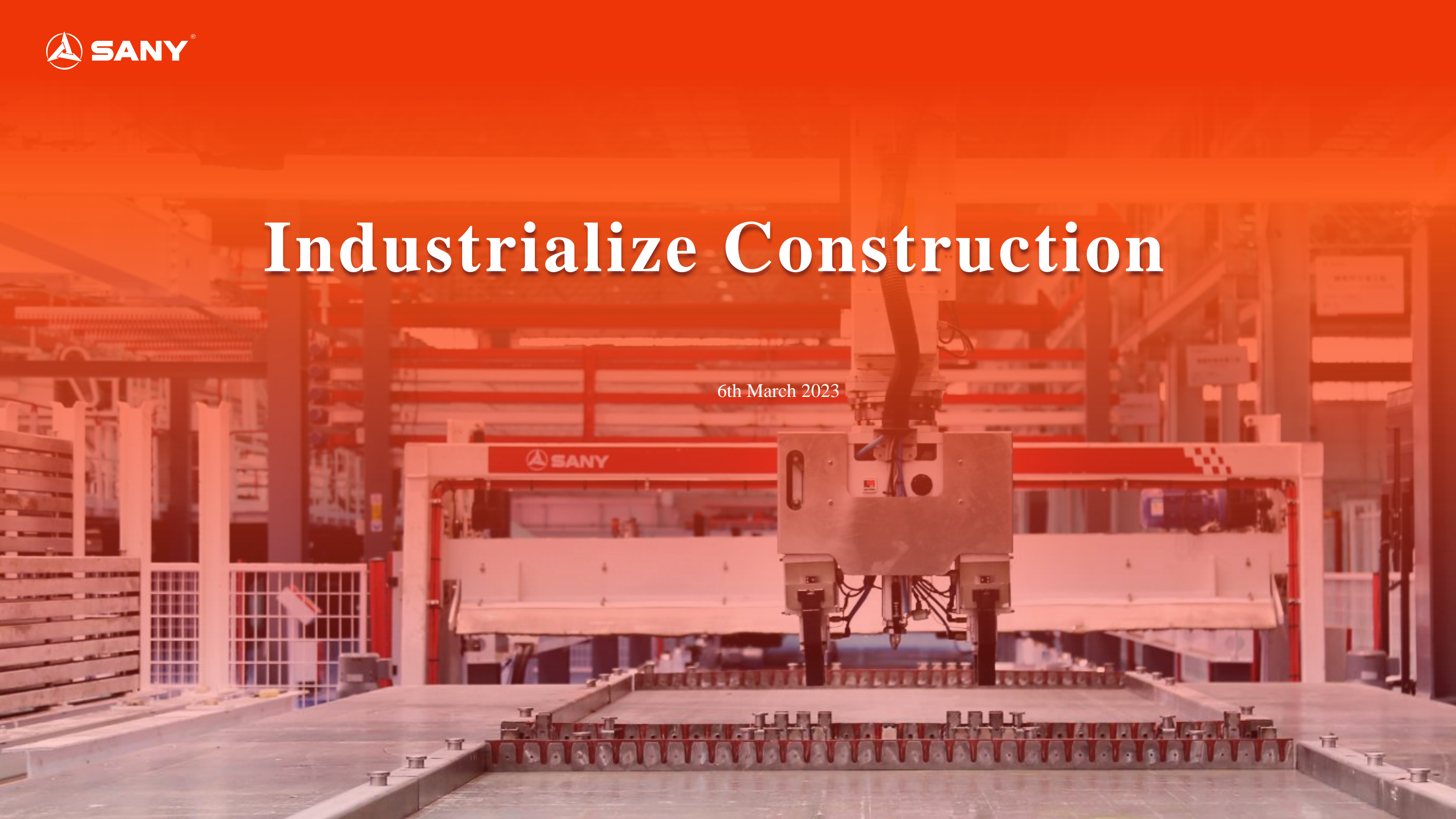


# Industrialize Construction

6th March 2023







## 【Who is Sany】



Start the business  
“Three first class ”



Double entry strategy  
“Quality changes the world”



Company Value  
“China's first stock reform”

“Top 3 Global  
construction machinery”



- Digital intelligence "products, manufacturing, operations"
- Electrification with “three horizontal and eight vertical “
- Globalisation in "USA, Germany, India and Pakistan“, acquire PM, cooperate with PF and etc.



# “T 2 E”: Enabling ecology to promote "three modernizations"

- ☐ Digital intelligence, electrification, internationalization
- ☐ Education, finance,.....

## Horizontal: Industrial Internet Platform

- ☐ Sany cloud platform for construction industrialization
- ☐ .....
- ☐ Zhuxiangyun Cloud platform for construction

## Vertical: Smart Manufacturing Capabilities

- ☐ Research, supply, production, sales,...
- ☐ “Hardcore technology”、.....
- ☐ Operational efficiency、.....

# 【 Dreams to be built 】

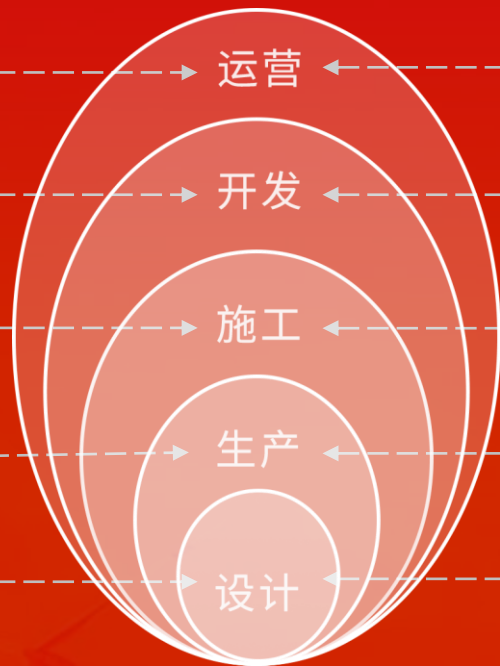




# 【The evolution of construction】

## Traditional

(2021)  
29.3  
trillion Yuan  
  
29.3  
trillion Yuan  
  
1.99  
billion m2  
  
800  
billion Yuan  
  
237.2  
billion Yuan



## Prefabricated

(2025)  
  
Assembly rate  
30%  
  
9 trillion Yuan  
  
**600  
million m2**  
  
600 billion m3 PC  
  
18 billion Yuan



**Urbanization Development: Beautiful City VS "Scattered and Dirty"**

**Traditional construction industry: it is the oldest and the largest, and there will be huge business opportunities, once it evolves!**

**Building industrialization 1.0~4.0 (prefabricated building design + intelligent construction method)**

- **1.0: Prefabricated building + Element factory production**
- **2.0: Prefabricated/modular buildings + automated production of element/factory assembly**
- **3.0: Prefabricated/modular/3D printing building + digital factory + platform driven**
- **4.0: C2M mode (individualized design + lighthouse factory manufacturing + AI platform collaboration)**

# 【Smart Construction Ecology】

技术  
路线

运营

开发

施工

生产

设计

**Vision: Make construction easy in the world**

**Mission: To industrialize construction**

**SANY positioning: "SPCS inside" (empowering intelligent construction)**

SPCP/D

筑享云

www.pcteam.com

SPCM/AI

Core competence:

"One vertical and one horizontal" (SPCS technical route + 5231 hardcore technology)



设计  
智能



制造  
智能

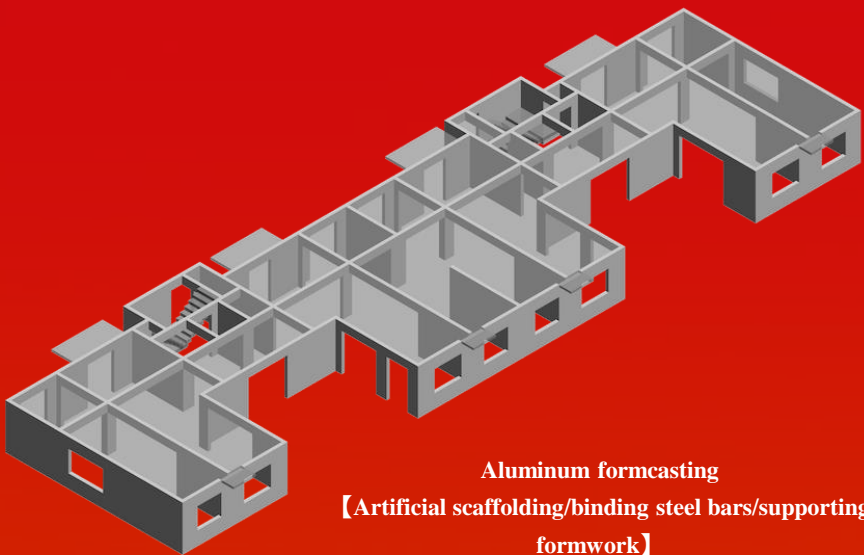


施工  
智能



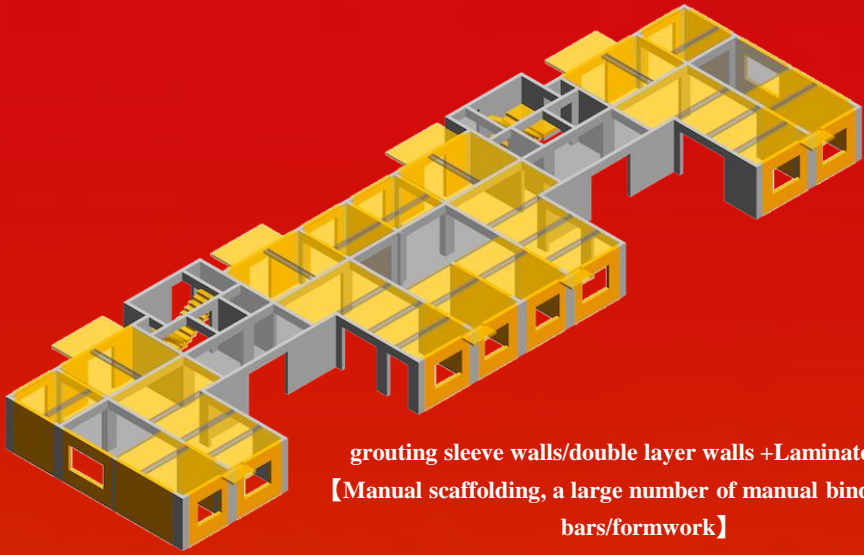
# 【Prefabricated building technology route】

## Traditional cast-in-situ building



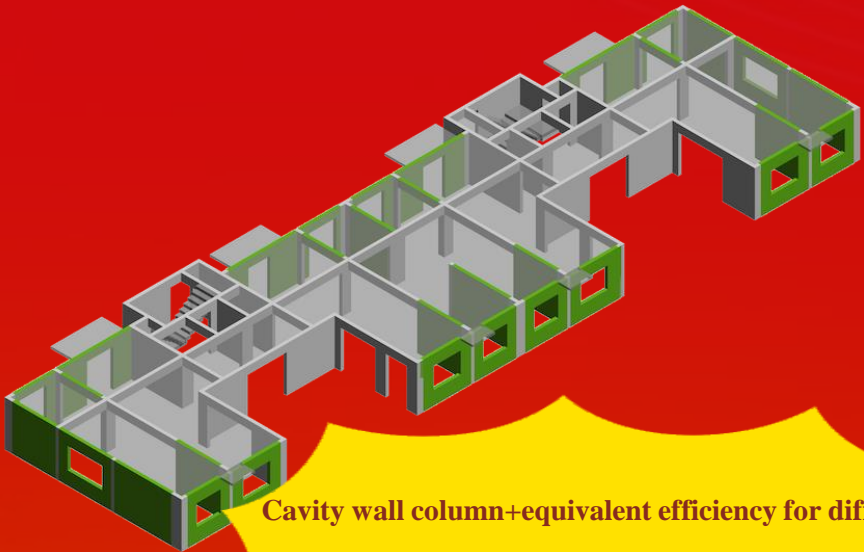
Aluminum formcasting  
【Artificial scaffolding/binding steel bars/supporting formwork】

## Conventional prefabricated building

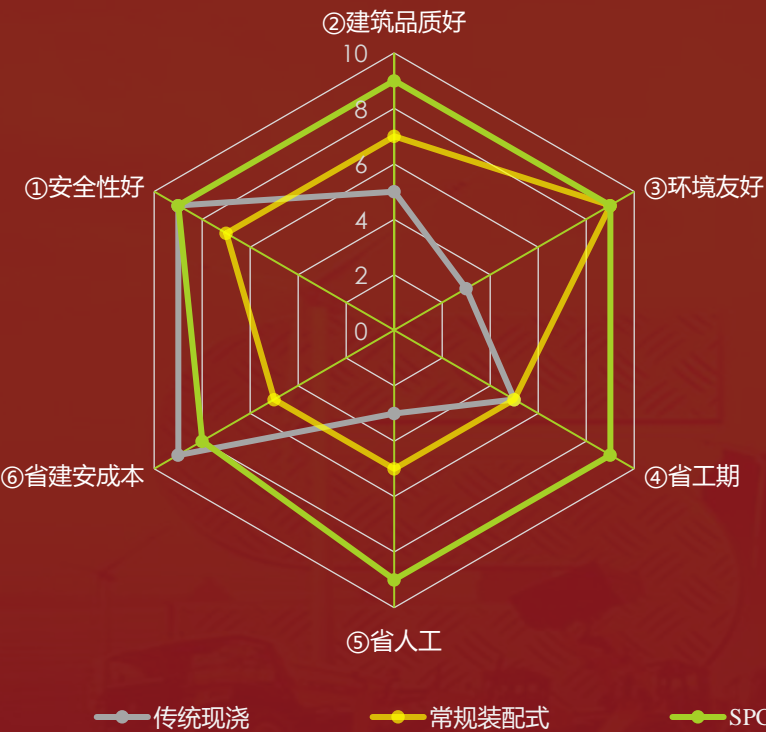


grouting sleeve walls/double layer walls +Laminated floors  
【Manual scaffolding, a large number of manual binding of steel bars/formwork】

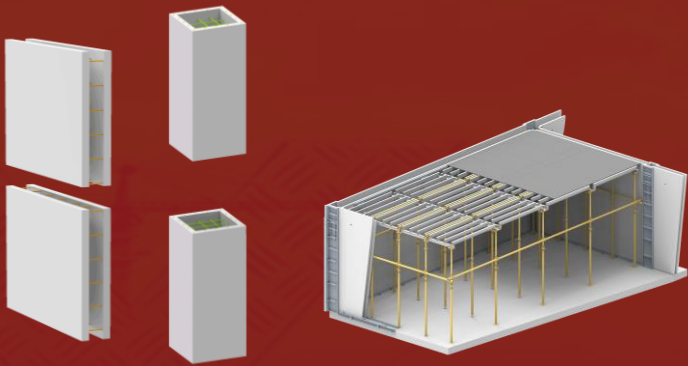
## SPCS prefabricated building



Cavity wall column+equivalent efficiency for different structure+mold technology+in plane operation



Comparison	Traditional cast-in-situ	Conventional Prefabricated	SPCS
Safety	Classic structural system relying on manual guarantee	Many sleeves, difficult for grouting and detection, discontinuous concrete	equivalent efficiency for different structures and equivalent to cast in situ
Quality	Poor flatness, needs plastering	More elements, more seams, easy to leak	Whole wall and whole board of high quality, Waterproofing after lapping
Environment	"Scattered and dirty"	Green and low-carbon	Green and low-carbon
Construction period	The construction speed is slow, 7-10 days/floor	Sleeve installation is difficult, 5-7 days/floor	High efficiency, 4-5 days/floor
Manpower	With the most manpower	Partial labor saving	Significant labor saving
Cost	Lowest cost at this stage	Laminated floor slabs are "a waste of money" High cost	Close to traditional cast-in-situ and low cost



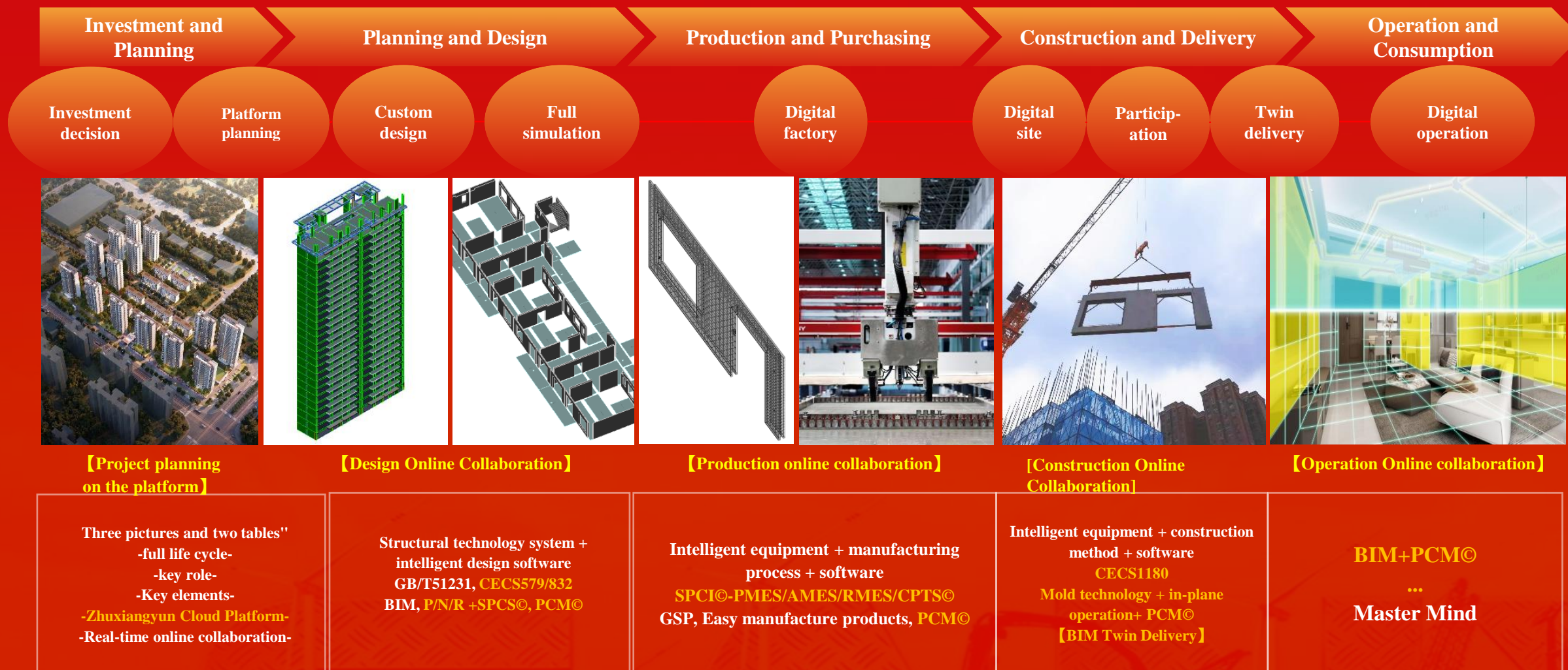
SPCS-3D Display

Construction method display



# 【Zhuxiangyun Cloud Construction】

From construction to product, from construction to manufacturing, from offline to online,  
from messy and dirty to better and more economical



墙柱梁板 (PCM一件一码全管控)

构件编号	YNQ02		
构件类型	空腔墙	方量(m³)	2.95
楼层	4F	楼号	3
重量(T)	3.6	砼标号	C40

设计1606 生产43 到达13 吊装43 验收153

**Zhuxiangyun Cloud (PCTEAM ©+SPCP/D ©+ SPCM© /AI +.....+ BIM Twin + Cockpit)**

**Sany cloud platform for construction industrialization RootCloud (Industrial Internet Platform)**

## 5 Types of Construction Industrialization Equipment

- Smart PC equipped with SPCE
- Smart AAC equipped with SACE
- Smart Rebar Equipment SSRE
- Tooling system equipped with SIME
- Transportation, crushing and recycling, etc...

## The top three in global construction machinery

- Excavator No. 1 in the world
- Large-scale rotary pile driver No. 1 in the world
- Concrete machinery No. 1 in the world
- Large lifting equipment No. 1 in Asia
- Other construction equipment with the most complete supporting facilities



# 【Rigorous verification】



China Construction  
Engineering  
Luban Award



Structure Great  
Wall Cup

## Theoretical Analysis/Mechanics Experiment/Expert Demonstration

Welded Rebar Mechanical Test  
Laminated Shear Wall Mechanical Test and Seismic Test  
Laminated Frame Column Mechanical Test and Seismic Test  
Laminated Beam Mechanical Test  
Mechanical test of thermal insulation connectors  
Thermal test of insulation connectors  
Experiments on connecting steel bars in laminated shear walls  
Basement external wall waterproof test  
Mechanical tests on weakened connections of laminated shear walls  
Prefabricated Mechanical Test of Concealed Column at the End

## Engineering test

Validation and optimization of laminated wall production process  
Process verification and optimization of laminated column production  
Verification of Laminated Shear Wall Installation Process  
Composite frame installation process verification  
Validation of basement exterior wall installation process  
Basement column installation process verification  
Integrated production and installation process verification of bay windows  
Plugging integrated production and installation process verification  
Process verification of thermal insulation integrated prefabricated wall panels  
Production and installation verification of full-section lapped columns

## Standards & Patents

CECS 579/832  
CECS 1180

Patent authorization 1000+  
Invention Authorization 100+



## Engineering practice

Renovation of shantytowns in the south of Yucheng Station  
Jindi Dada Intelligent Robot Industry Base No. 1 Hengbang, Zhongxian County, Chongqing  
Canteen of Sany Beijing Manufacturing Center  
Handan Fengfeng Middle School  
House in Sany Street, Loudi  
Linli Emerald Bay Residence  
.....

## Scale application



National Synthetic Biotechnology Innovation Center  
Beijing Changping Xiejia Project  
Changping Future City Innovation Base Project  
Beijing Baishan Asuwei Project  
Beijing Jingneng Mentougou Xinhua Yuan  
Longhu Zhuxin Zhuang Project  
Longhu Sidao Bridge Project  
Longhu Guanzhuang Project  
Longhu Shunyi Renhe Town Project  
BBMG Chaoyang Shibaidian Project  
Jin Mao Shunyi International Community Project

Resettlement House in Xinbang Town, Songjiang, Shanghai  
Shanghai Zhongjian Shentuo Fengxian New City  
Shanghai Zhongjian Shentuo Caolu Town Project  
Xi'an Yuncheng Project  
Jiangdu Xinyuan, Fengxi New City, Xixian New District  
Chongqing Cuiyun Project  
Chongqing Yongjiang photogenic  
Chongqing Caijia Resettlement Housing Project  
Changsha Yungu Residential Project  
.....



清华大学  
Tsinghua University



中国建筑科学研究院  
China Academy of Building Research

中國工程院



BIAD



LONGFOR  
龙湖

Gemdale



中冶建工

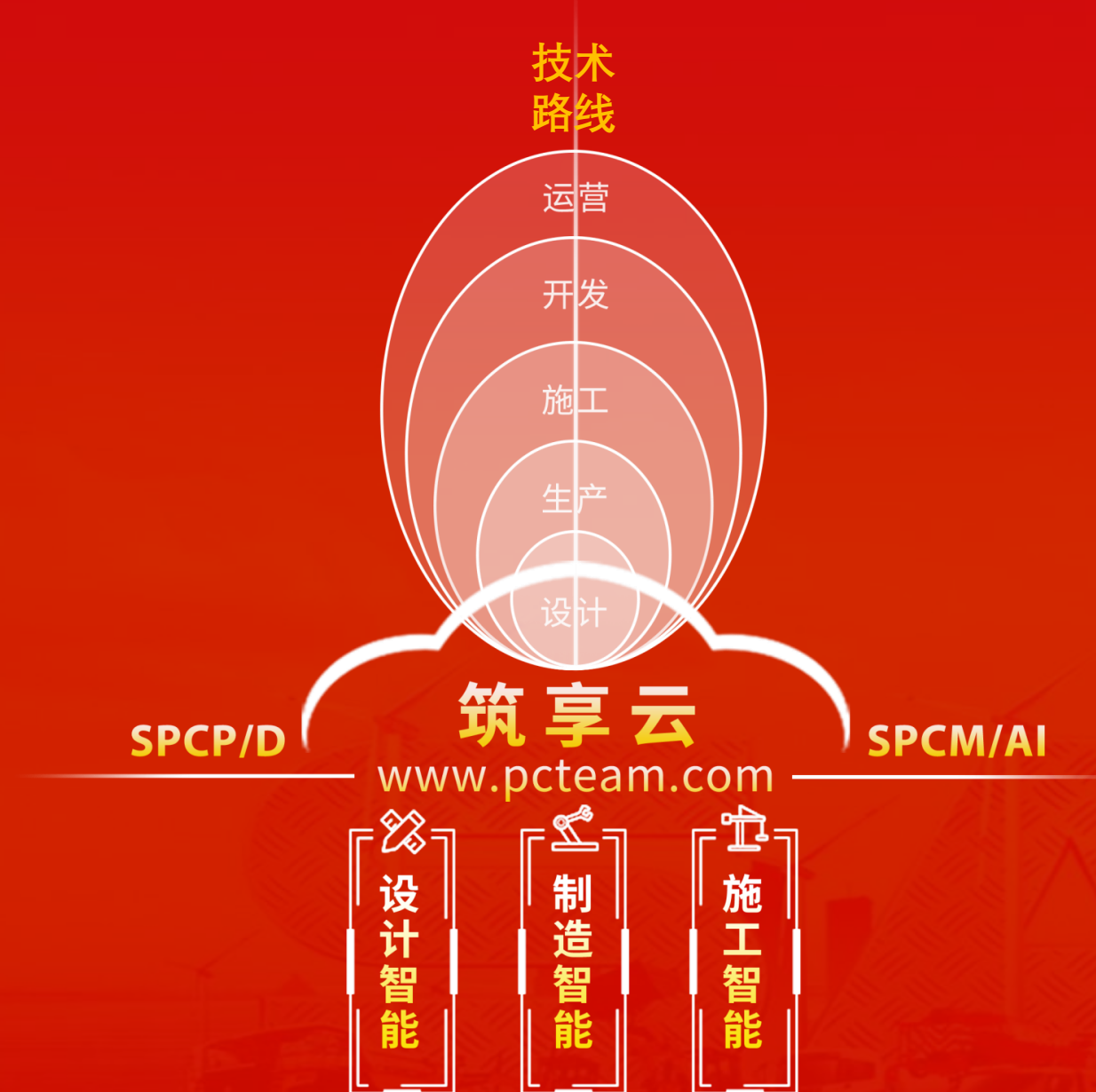


TIANHUA 天华





# Make construction easy in the world



## SPCS inside

The safety cost of prefabricated building structures is low, and the construction of Zhuxiangyun Cloud is green, low-carbon, fast and economical

Party A: project selection – decision making - bidding - coordination

Party B: E, P, C, financial services, ...

- E-Planning and Design: Design Institute + Sany Architectural Design Institute +...
- P-Production and procurement: PC, steel bars, ... building materials
- C-Construction and delivery: hoisting, labor, ... construction

Party C: "SPCS inside" (Industrialize construction and empower the construction ecology)

Technical route: Cavity wall column+equivalent efficiency for different structure+mold technology+in plane operation.

- |                             |  |
|-----------------------------|--|
| <b>5 types of equipment</b> | 1. PC equipped with SPCE, 2. AC equipped with SACE, 3. Rebar equipped with SSRE, 4. Complete sets of tooling and molds, 5. Ancillary equipment such as transportation and crushing and recycling (+ top three global construction machinery) |
| <b>2 sets of standards</b>  | 1. Structural Technical Standards (CECS 579 / 832), 2. Construction Acceptance Standards (CECS 1180)   |
| <b>3 type of softwares</b>  | 1. A series of intelligent deepening structure design software P/N/R+SPCS, 2. Series of industrial software SPCI-PMES/AMES/RMES/CPTS, 3. Series of management software PCM...  |
| <b>1 Zhuxiangyun cloud</b>  | Pcteam.com+SPCP/D+SPCI/M+...+BIM twin+cockpit  |