

塑造智慧变革



HEXAGON

海克斯康



北京
国家会议中心

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9月10-12日

2018.hexagonchina.com.cn

Leica iCON Construction Total Station Solutions- Building Tomorrow Leica iCON建筑全站仪解决方案- 建设未来

Moritz Lauwiner, VP Product Management

11, 09, 2018

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 - c) 工作流程
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 - a) BIM工作流程



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Building Construction Industry 建筑施工行业

Overview/概述

Construction China 2018

- Construction expenditures in China will rise approx. 8% per annum through 2019. (world: 5.5%)
- **Nonresidential building construction** will remain the largest and fastest **growing** segment,
 - driven by growing **consumer** spending for domestically manufactured goods and services.
- **Residential building construction** will benefit from **migration** from rural to urban areas.
- Business Volume of China Construction Industry is **17.6 trillion yuan (2017)**.

2018年中国建筑业

- 中国建筑行业支出一直在增加，到2019年达到每年增加8%。(世界平均增加: 5.5%)
- 非住宅建筑仍然是支出最大、增长最快的部分
 - 受国内制造业产品和服务消费增长的推动
- 住宅受益于城市人口的增长
- 中国建筑行业的业务量在2017年是17.6万亿

Global Construction Facts

全球

建筑

大数据

Global construction forecast to grow at CAGR of 5.5% 2016-2021

全球建筑业产值预测将在2016-2021年每年增长5.5%



The industry is changing with the adoption of digitalisation
随着数字化技术的采用，这个行业正在发生变化



Large projects take 20% longer than scheduled
大项目一般要比计划工期延长20%的时间

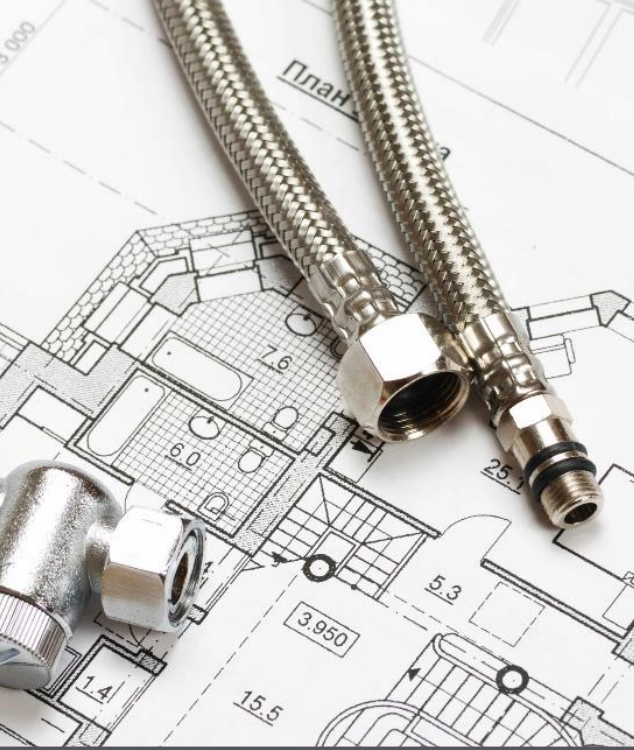


are up to 80% over budget
实际支出一般比预算多出80%



Global Construction 2020 report & McKinsey & Company

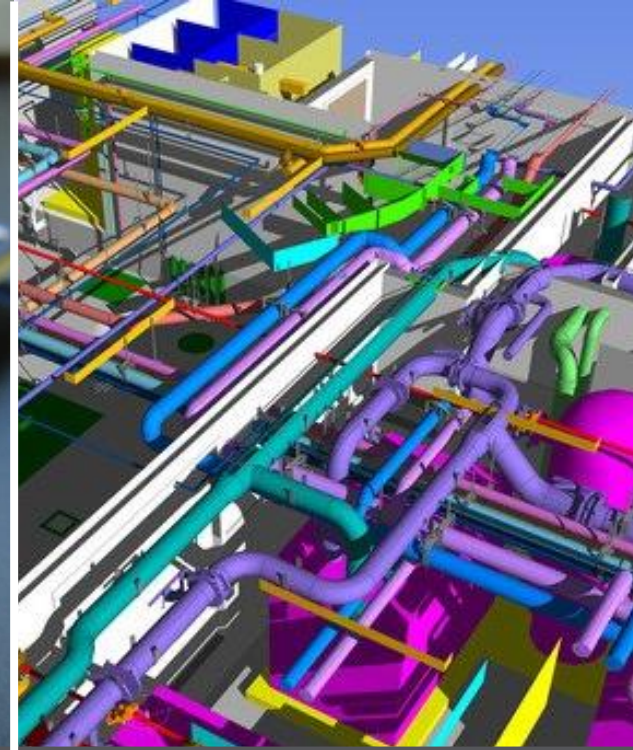
The issues facing today's Construction industry 建筑行业今天正面临的问题



Inaccurate & outdated data
错误及过时的信息



Manual & error-prone workflows
易出错的工作流程



Tighter schedules & specifications
严格的工期及规范



Liability & risk to project & people
项目及工人风险责任

Using digital solutions can deliver...

数字化的解决方案可以解决...

Improved accuracy & reliability
提高信息准确性和可靠性



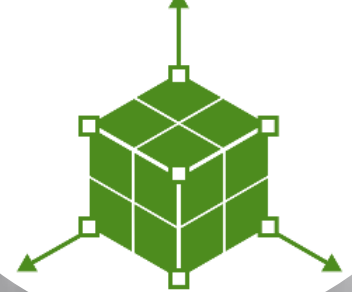
Improved performance & profitability
改善性能和盈利能力



Reduced risk of costly errors. Protect Health and Safety
降低错误风险，保护财产和人身安全



Compliance to digital projects: win more work
使用数字技术进行服务：赢得更多的业务



Building Construction Applications 建筑行业应用

Concrete, Mechanical, Electrical, Plumbing

混凝土、机械、电气、管道





Concrete Edges: Columns, footings & slabs
混凝土模板: 柱, 基础 & 预制板



Concrete structures:

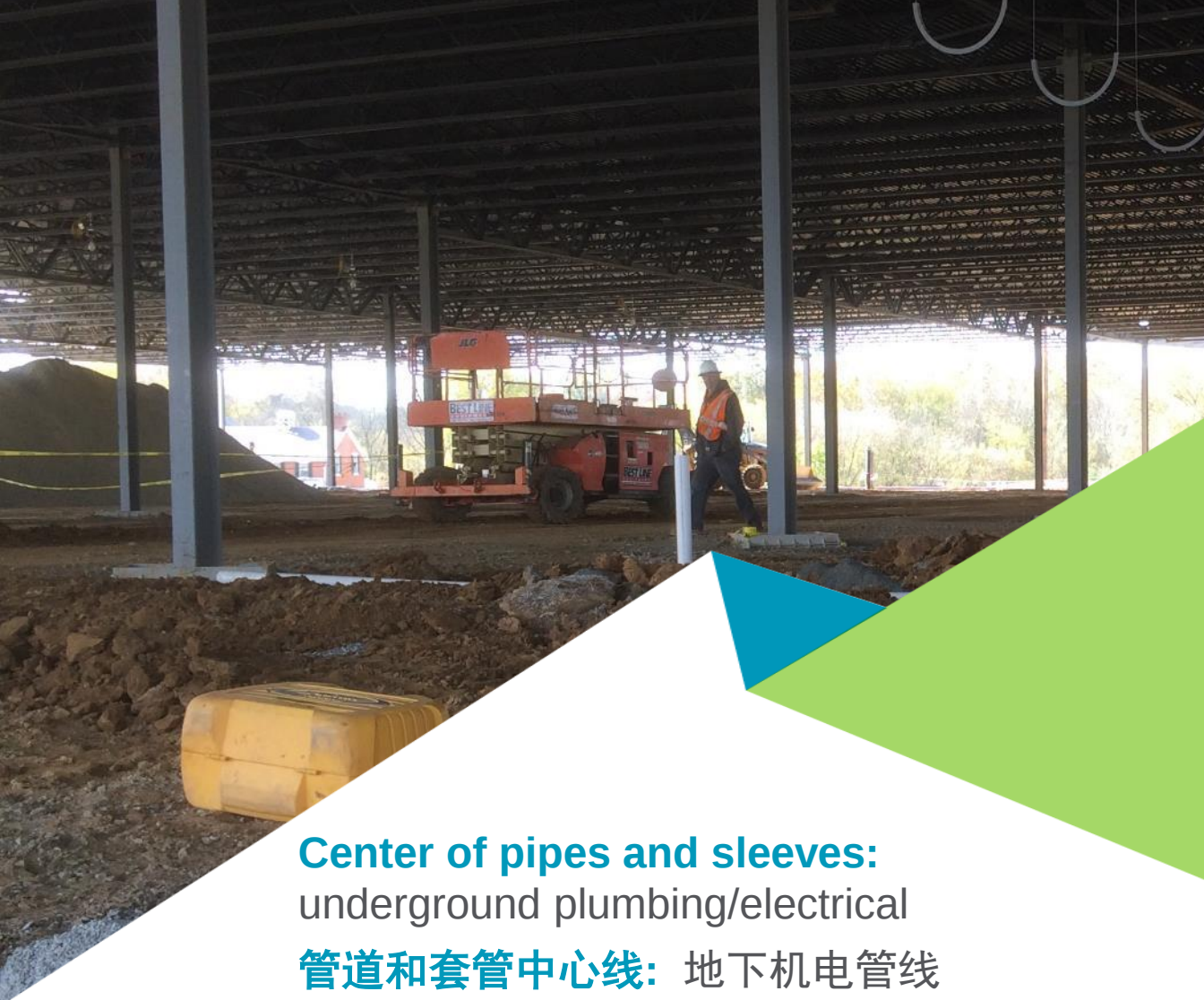
Re-bar fixtures, foundations, pile caps

混凝土结构: 钢筋固定, 基础, 承台



Concrete Openings: location of sleeves for bldg systems, air shafts, elevator shafts, stub ups

混凝土开孔: 建筑系统套管位置, 通风井, 电梯井, UPS安装



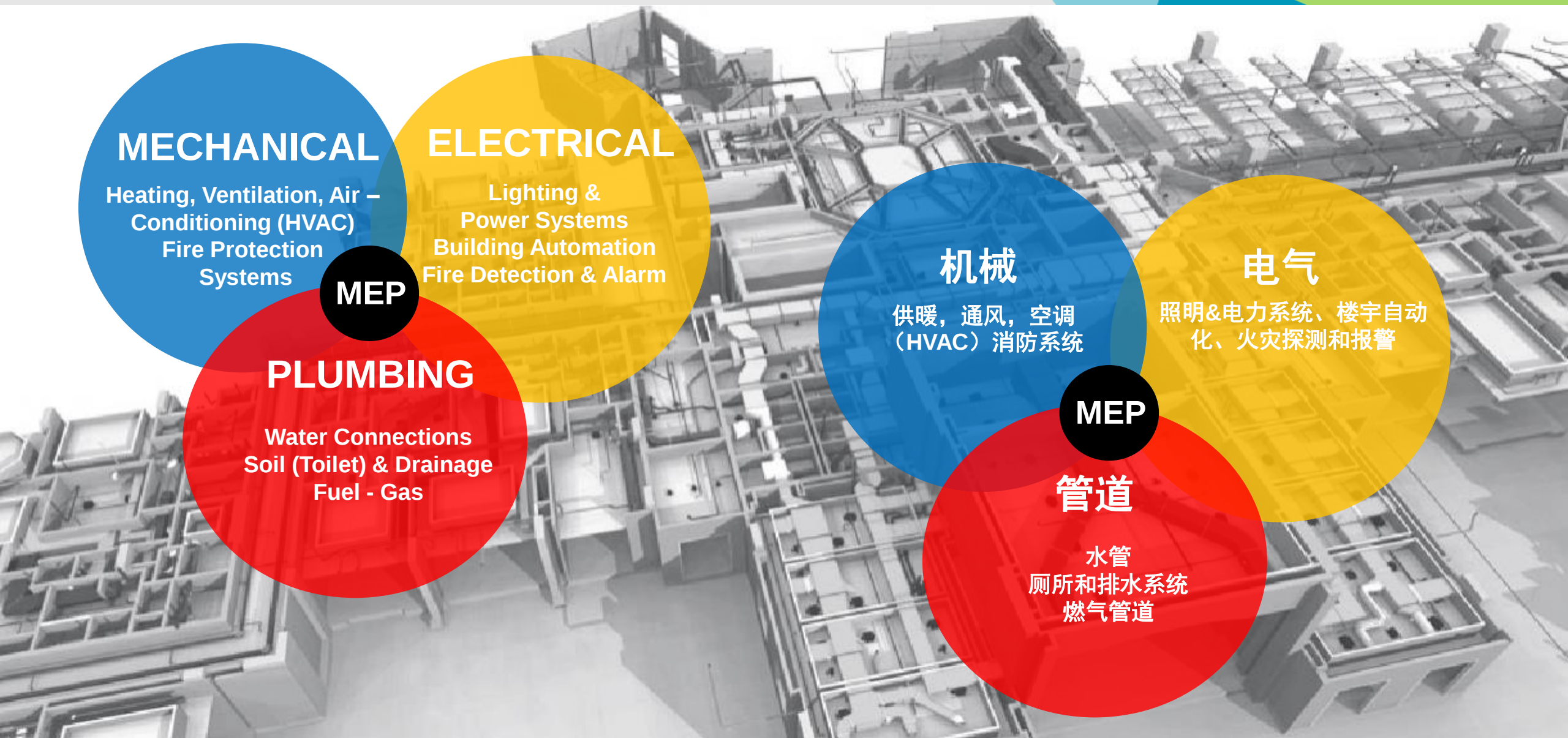
Center of pipes and sleeves:
underground plumbing/electrical
管道和套管中心线: 地下机电管线





Anchor Bolt Locations: on concrete footings for installing steel columns

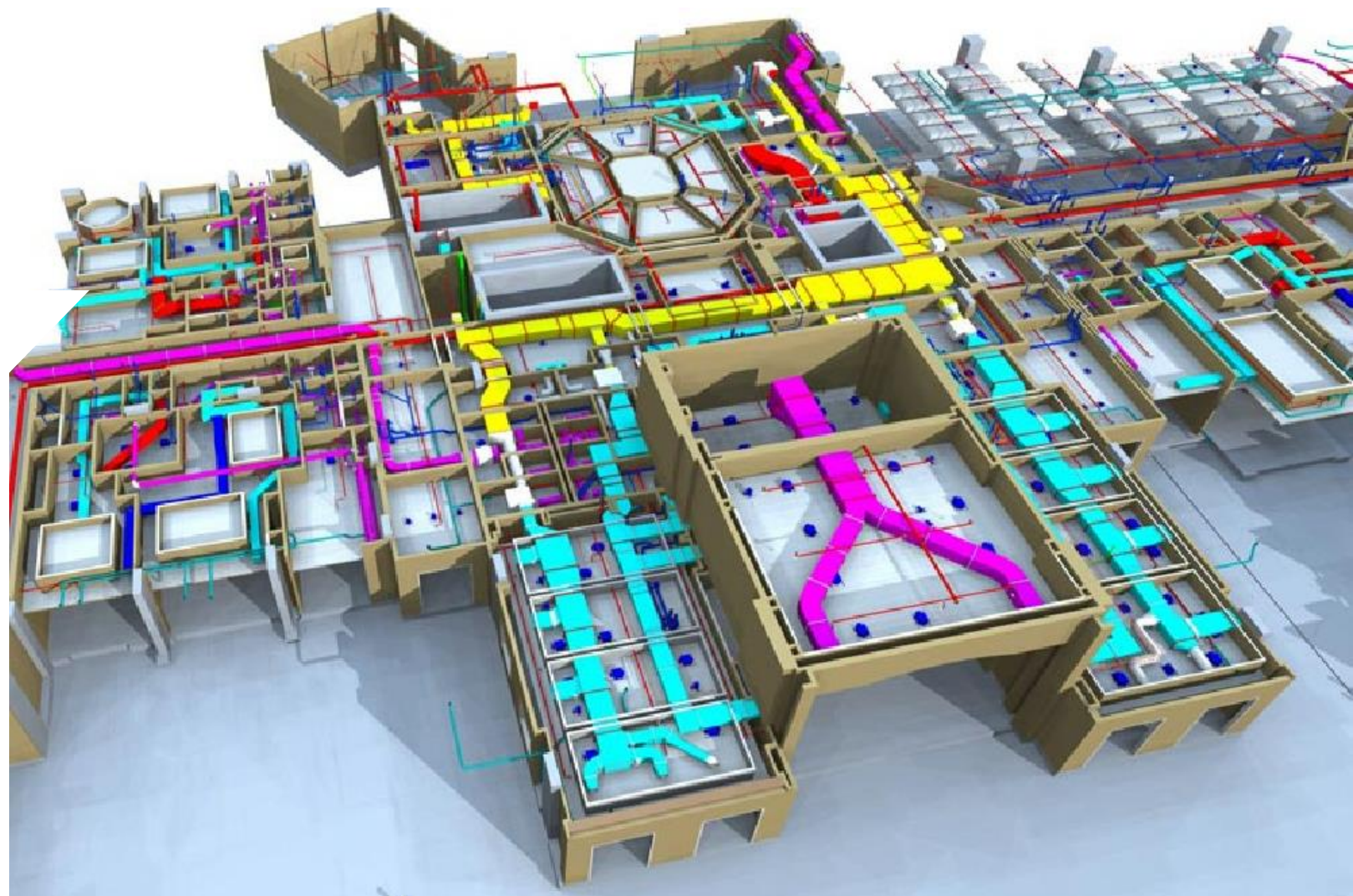
锚栓位置: 在安装钢柱的混凝土上



MEP

Design & Engineering 设计 & 施工

2D & 3D Modelling for BIM
projects & manufacturing
BIM项目和制造的2D和3D模型



MEP

Manufacturing & Assembly

制造&装配式

Off-site manufacturing & on-site assembly of complex MEP

场外制造&现场安装复杂的MEP



MEP

Construction & Installation

施工 & 安装

Pipes, HVAC ducts,
electrical cable trays,
hangers & inserts

管道, 空调管道, 电器电缆
桥架, 支吊架&嵌入套管



New Leica iCON Construction Total Stations

新型Leica iCON 建筑全站仪

iCR70 and iCR80 with iCON Build Software

搭载 iCON Build的iCR70 和 iCR80





ANALOGUE/传统



DIGITAL/数字化

Next generation of Leica iCON Construction Total Stations 新一代Leica iCON建筑全站仪



*with ATR &
SpeedSearch/快速搜索*

iCR70

Building Construction/建筑工程
and
Civil Engineering Construction/土木工程
(off-machine) (不支持机械控制)



*with ATRplus &
PowerSearch/超级搜索*

iCR80

Building Construction/建筑工程
and
Civil Engineering Construction/土木工程
(on-/off-machine) (支持机械控制)

Next generation of Leica iCON Construction Total Stations

新一代Leica iCON建筑全站仪

iCR80 – ATRplus technology/ATRplus 技术

Self-learning/自动学习

- i. Learning the environment/环境
- ii. Learning non-relevant target/不相关目标
- iii. Learning foreign reflections/无效目标
- iv. Learning the ranges & dynamics/棱镜范围 & 动态跟踪

ATRplus features/特点

- i. Dynamic energy control/动态跟踪
- ii. History logs/跟踪历史记录
- iii. Extensive laser spot analysis/大量激光点分析
- iv. Tight control loop/严密的循环控制



Next generation of Leica iCON Construction Total Stations 新一代Leica iCON建筑全站仪 iCR80 – ATRplus technology/ATRplus 技术

Dynamic energy control/动态跟踪



GRZ101



GRZ122



MPR122



GMP101



GPR121

+25%

450m

+33%

1000m

+33%

1000m

+33%

1000m

+50%

1500m

Range increases for Icr80/ICR80测量范围增加

More performance in difficult situations/在复杂现场中有更优秀的表现

Next generation of Leica iCON Construction Total Stations

新一代Leica iCON建筑全站仪

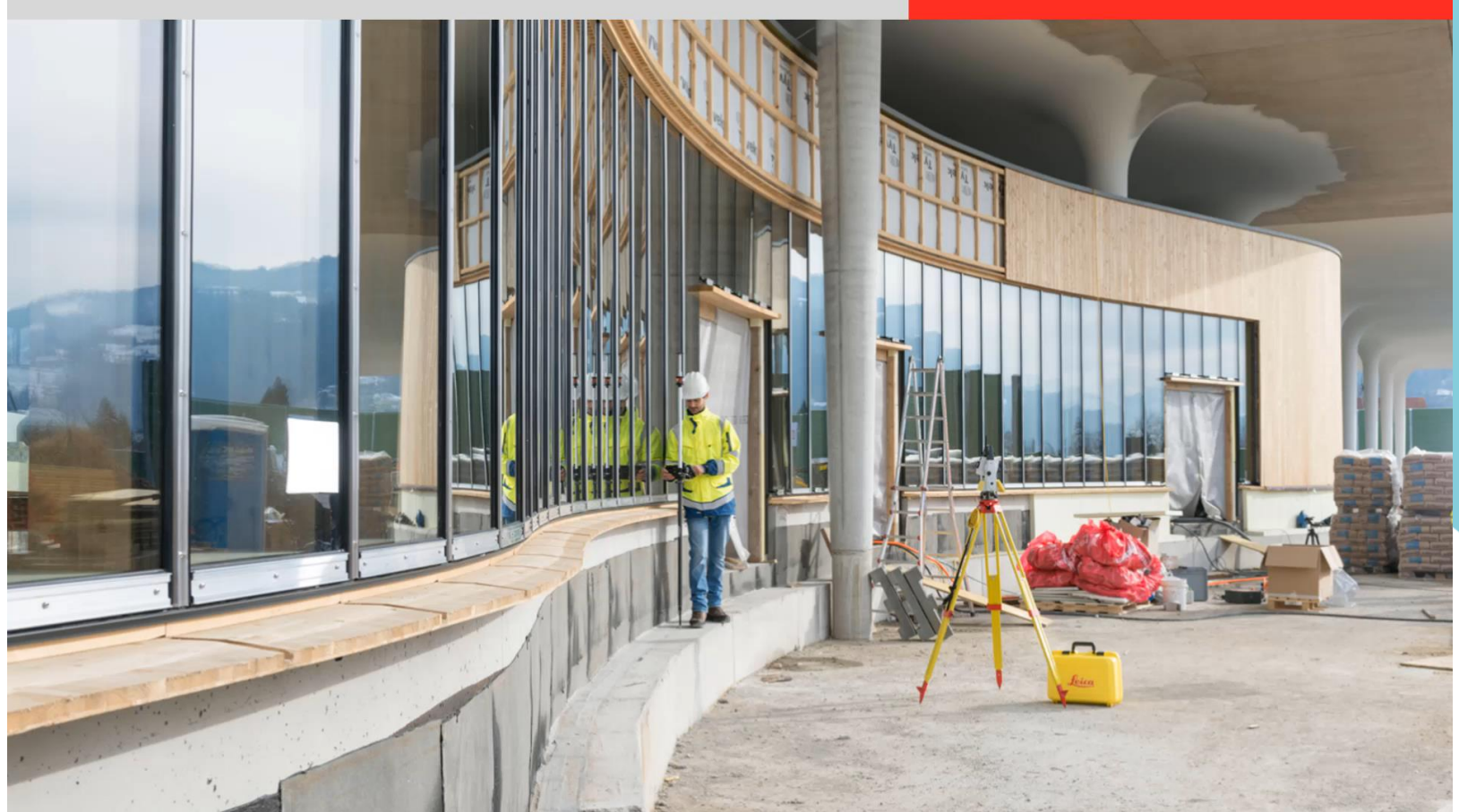
iCR80 – ATRplus technology/ATRplus 技术

Tight control loops

严密的循环控制

Gives benefit of Increased Lock-stability

增强棱镜锁定的稳定性



Next generation of Leica iCON Construction Total Stations

新一代Leica iCON建筑全站仪

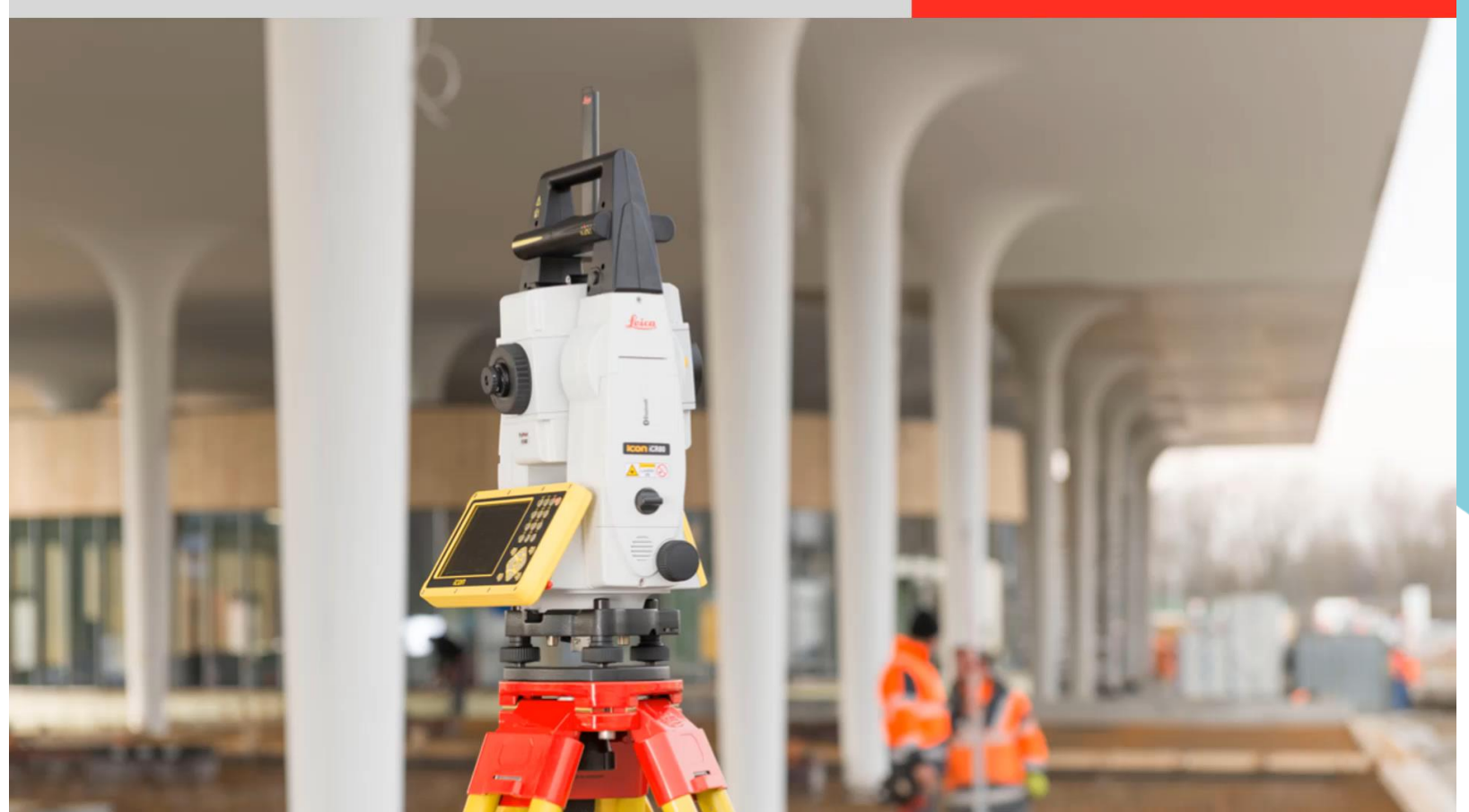
iCR80 – ATRplus technology/ATRplus 技术

History logs and virtual target ID

记录跟踪历史记录

Allows the crossing of a locked prism behind and before other prisms

允许锁定的棱镜穿过别的棱镜的前面和后面



Next generation of Leica iCON Construction Total Stations

新一代Leica iCON建筑全站仪

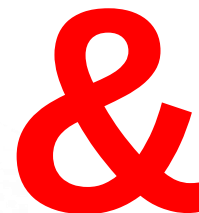
Leica iCON解决方案

- Digitalisation/数字化
- BIM
- Tailored/建筑行业定制
- Robotic/自动化
- Accuracy/精确



iCON robotic Construction total stations

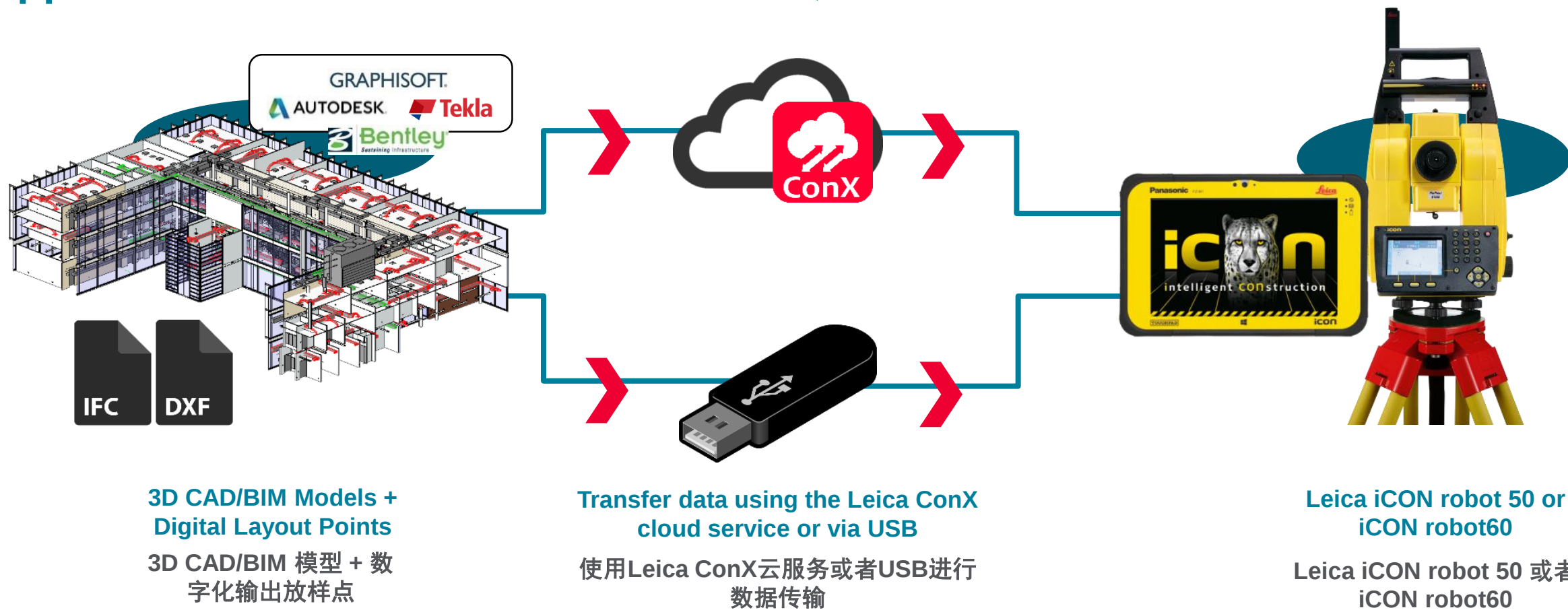
iCR70 / iCR80 **NEW**



iCON CC80 tablet
iCON build software

BIM-to-Field 3D Layout Workflow/BIM-工地3D工作流程

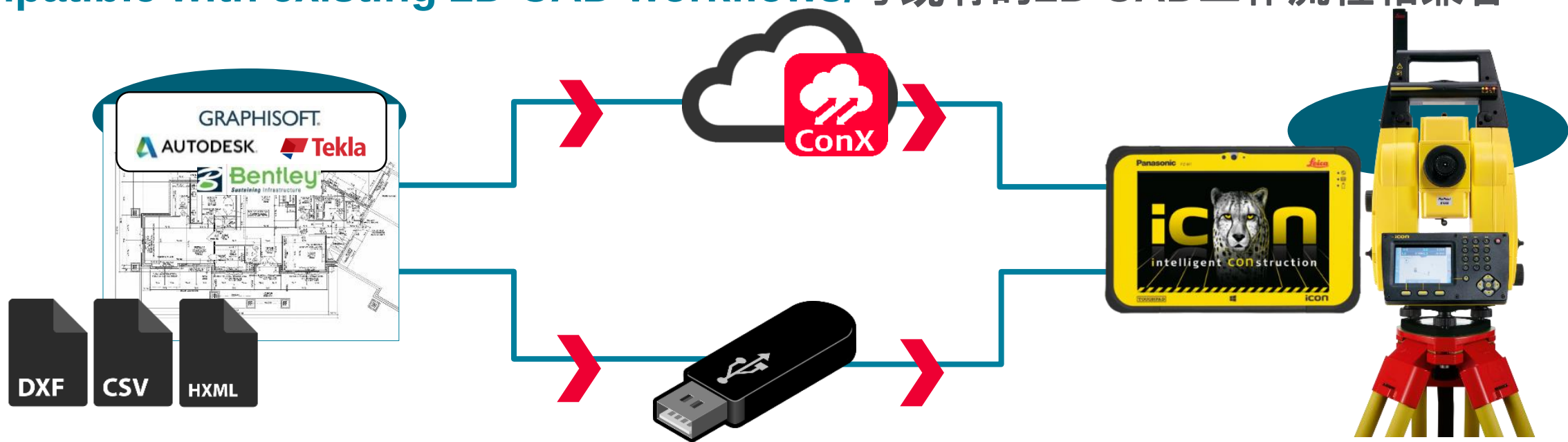
Supports modern 3D BIM workflows/支持现有3D BIM workflows



Office-to-Field 2D Layout Workflow

办公室-工地2D图纸工作流程

Compatible with existing 2D CAD workflows/与现有的2D CAD工作流程相兼容



2D CAD Drawings +
Digital Layout Points

2DCAD图纸+ 数字化输出放样点

Transfer data using the Leica ConX
cloud service or via USB

使用Leica ConX云服务或者USB进行
数据传输

Leica iCON robot 50 or
iCON robot60

Leica iCON robot 50 or
iCON robot60

Simple workflows for coordinating your position on site

现场定位的简单工作流程



Increased efficiency on site with reduced errors & rework

通过在现场减少错误和返工来提高工作效率

Digitalisation gives 400 % productivity increase

数字化增加了400%的生产力



200points

800points



BIM ready and compatible with IFC BIM Industry Standard/与BIM行业标准IFC兼容



Building Information Modelling BIM 建筑信息模型BIM

iCR70 and iCR80 with iCON Build Software are BIM ready
搭载iCON Build软件的ICR70 80

Leica Solutions/徕卡解决方案

A little BIM/一点BIM



- 介绍3D、4D、5D等的概念及包含的内容

Leica Solutions/徠卡解决方案

A little BIM/一点BIM

3D

- Existing Conditions Models

- Laser scanning

- Ground Penetration

- Radar (GPR) conversions

- Safety & Logistics Models

- Animations, renderings, walkthroughs

- BIM driven prefabrication

- Laser accurate BIM driven field layout

- Laser Scanning
- 激光扫描

- Ground Penetration Radar
- 探地雷达

- ...renderings...
- 动画、渲染、演示

- Laser accurate field layout
- 精确的激光现场布局



INFORM/信息

Pre-Construction / As-Built

设计/竣工

**ENRICH /多样
Construction/建筑
Layout/输出****VALIDATE/验证**

As-Built During Construction

施工及竣工



Summary/总结

Leica iCON – intelligent Construction

Leica iCON – 智慧建设



Summary/总结

- Leica offers intelligent construction Solutions tailored for the Building Construction and Civil Infrastructure Construction Industry/徕卡为建筑行业 and 土木工程行业量身定做了智慧建筑解决方案
- The latest Leica iCON Construction Total Station solution consists of robotic total stations iCR70, iCR80 with iCON Build Software/最新一代的iCON建筑全站仪解决方案包含了搭载iCON Build软件的机器人全站仪iCR70、iCR80
- The solution is designed supporting customers with their Digitalisation efforts with Concrete and MEP applications/解决方案通过具体的混凝土和MEP应用来支持用户的数字化工作
- The solution increases: /解决方案提高了:
 - Productivity : more points per day/生产力 : 每天放样更多的点
 - Timely Project Completion: less risk of rework due to precise conformance to construction tolerances/项目进度完成: 因为施工的高度精确而减少了返工的风险
 - Safety: more focus on construction hazards thanks to support by measurement automation/安全: 由于测量自动化的支持, 可以更多地注意施工危险
- Leica iCON is fully BIM compatible by supporting the iFC global BIM standard/徕卡iCON通过支持国际BIM标准IFC而与BIM完全兼容
- Leica iCON construction solutions are flanked by a full basket of Hexagon Geosystems solutions supporting your challenges in the management of construction projects/徕卡iCON建筑解决方案作为海克斯康测量系统解决方案的侧翼, 支持建设项目管理中遇到的挑战



We help you creating
**SMART DIGITAL REALITIES for
CONSTRUCTION**
by Capturing the Reality of the Present
and
by Laying out the Design of the Future

我们来帮助您实现
建筑智能数字化
通过获取现在的真实信息及
通过布局未来的设计

Thank you for your attention!

—— 谢 谢 ——

