



HNCEG

Hunan Construction Engineering Group

Hao Chen

Title : deputy general manager
and chief engineer of HNCEG

Social post : professor level senior engineer
vice chairman of China Construction
Industry Association
Central South University postgraduate
part-time tutor

Major : draw up enterprise BIM plan,
facilitate BIM plan execution, transform
BIM technology into productivity



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Ding Tan

Title : technical director of
BIM Center of HNCEG

Title: deputy chief engineer
technical consultant of
BIM Center of HNCEG

Tuo Shi



HNCEG



Geographic Location

CHANGSHA, HUNAN



July ,1952



Establish time

 Business domain


More than **30** countries and regions



13 Billion USD

 Business scale

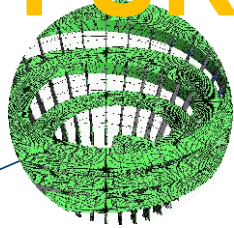
Professional large-scale general construction contractor integrated with **housing construction, municipal administration, steel structure and hydraulic engineering, etc.**

 Industry field

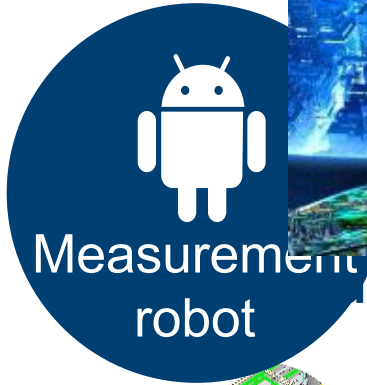
China Enterprise Top **500**

 Position in industry

Industry chain reconstruction **NEW** Housing construction **FUTURE**



Steel structure



Measurement robot



Smart city



Composite Pipe gallery net of things



municipal building administration centralized network supplier purchasing platform

湖南安装 集中采购管理系统

序号	物资名称	物资型号	工程名称	采购单位	经办人	物资状态
1	RK-2014-4-00020	(020004)内墙腻子粉	湖南长沙西洲(北)安置房二期工程	湖南长沙西洲	梅宇	物资已领用
2	RK-2014-4-00021	(020004)100目筛网	湖南长沙西洲(北)安置房二期工程	湖南长沙西洲	梅宇	物资已领用
3	RK-2014-4-00024	(020004)100目筛网	湖南长沙西洲(北)安置房二期工程	湖南长沙西洲	梅宇	物资已领用
4	RK-2014-4-00026	(020004)100目筛网	湖南长沙西洲(北)安置房二期工程	湖南长沙西洲	梅宇	物资已领用
5	RK-2014-4-00028	200#筛网	湖南长沙西洲(北)安置房二期工程	湖南长沙西洲	梅宇	物资已领用
6	RK-2014-4-00029	(020004)100目筛网	湖南长沙西洲(北)安置房二期工程	湖南长沙西洲	梅宇	物资已领用
7	RK-2014-4-00034	(020004)100目筛网	湖南长沙西洲(北)安置房二期工程	湖南长沙西洲	梅宇	物资已领用
8	RK-2014-4-00033	(020004)100目筛网	湖南长沙西洲(北)安置房二期工程	湖南长沙西洲	梅宇	物资已领用
9	RK-2014-4-00036	(020004)100目筛网	湖南长沙西洲(北)安置房二期工程	湖南长沙西洲	梅宇	物资已领用
10	RK-2014-4-00042	(020004)100目筛网	湖南长沙西洲(北)安置房二期工程	湖南长沙西洲	梅宇	物资已领用
11	RK-2014-4-00009	(020004)100目筛网	湖南长沙西洲(北)安置房二期工程	湖南长沙西洲	梅宇	物资已领用
12	RK-2014-4-00005	(020004)100目筛网	湖南长沙西洲(北)安置房二期工程	湖南长沙西洲	梅宇	物资已领用



Road & Bridge enterprise library family



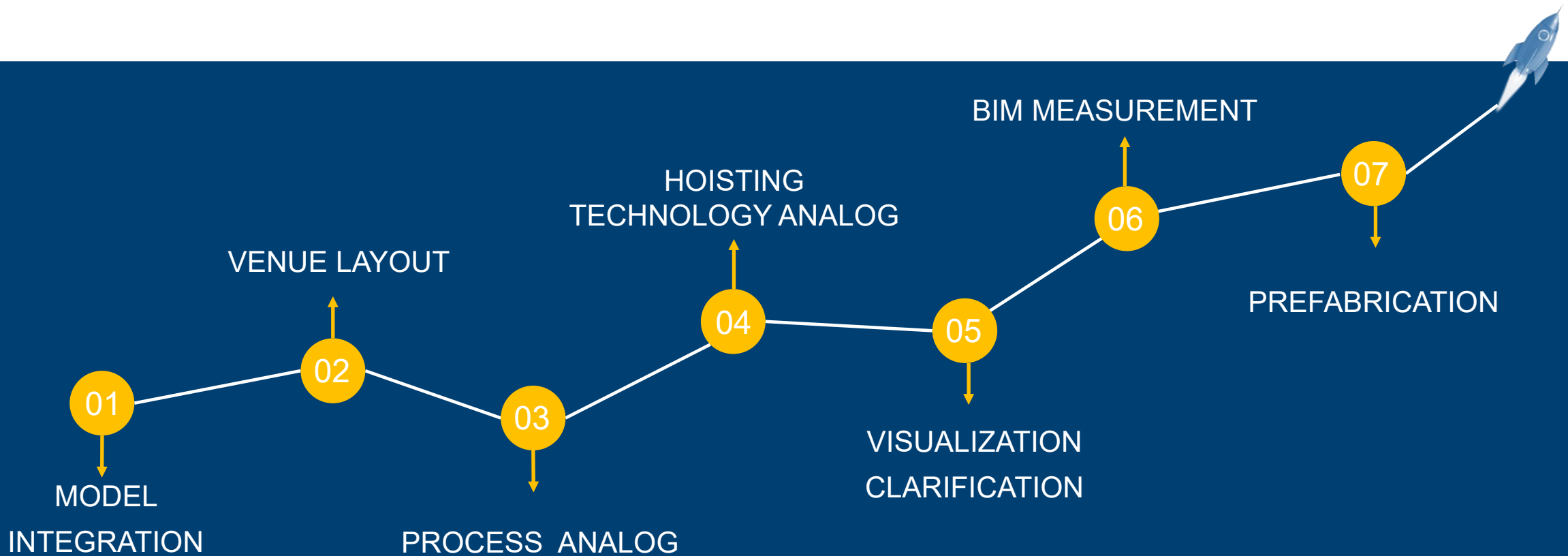
BIM used in tackling the world's largest double helix steel structure



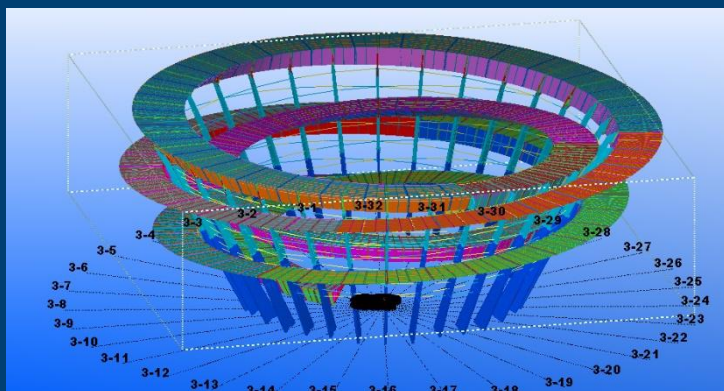
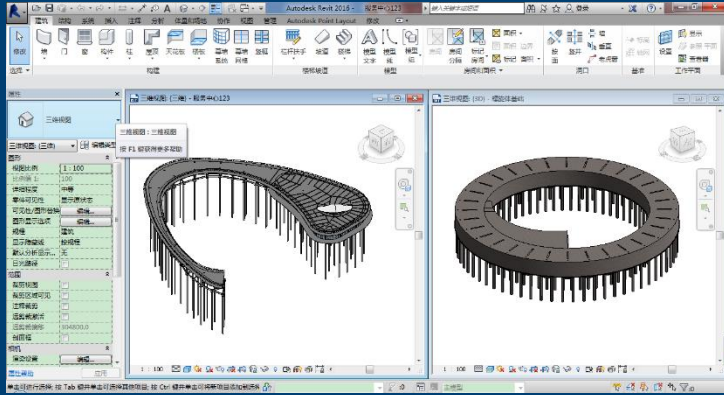
An aerial photograph of a large, circular stadium, likely the National Stadium in London, is shown in a monochromatic blue color. A white wireframe mesh is overlaid on the stadium's structure, highlighting its complex geometry. The text "BIM Solution" is centered in a bold, yellow font over the wireframe.

BIM Solution

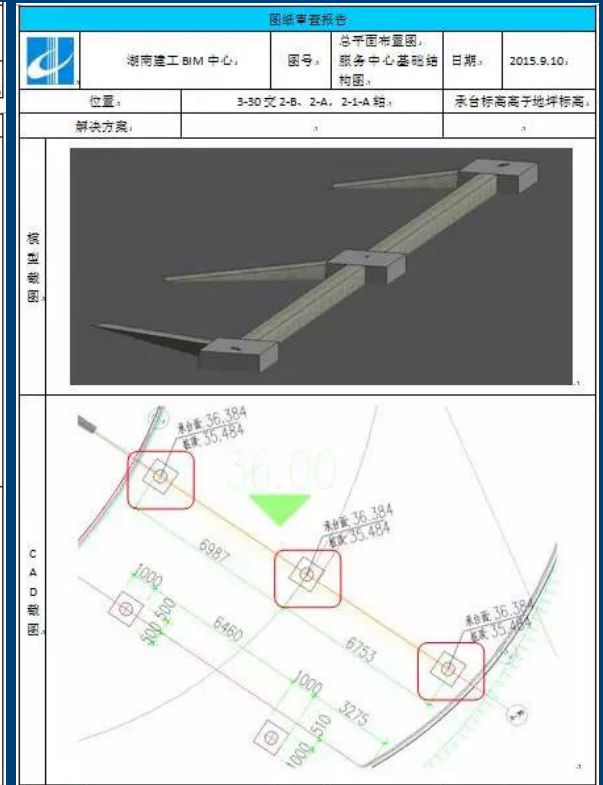
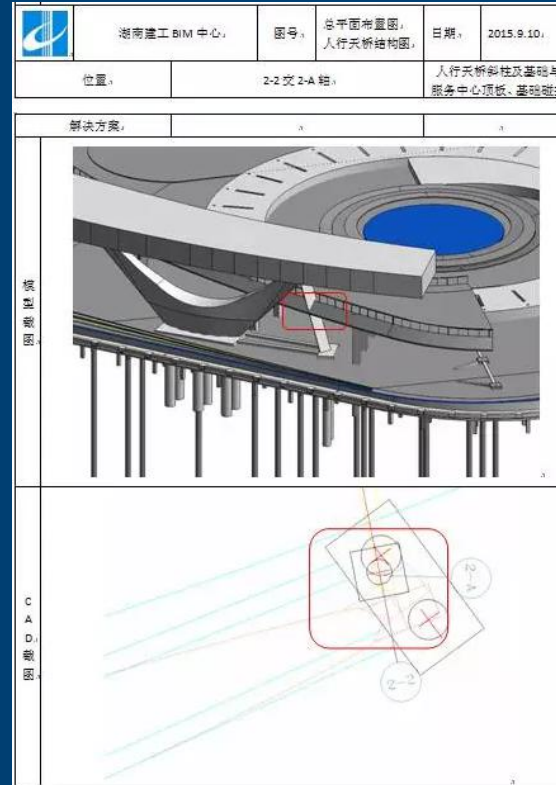
BIM APPLICATION PROCESS



01 MODEL INTEGRATION



→
**collision
check**



01 MODEL INTEGRATION

HNCEG

DIFFIERENT

contracting mode

between **China** and **American** !

EPC

AMERICAN

PC

CHINA

Why did we do this ?

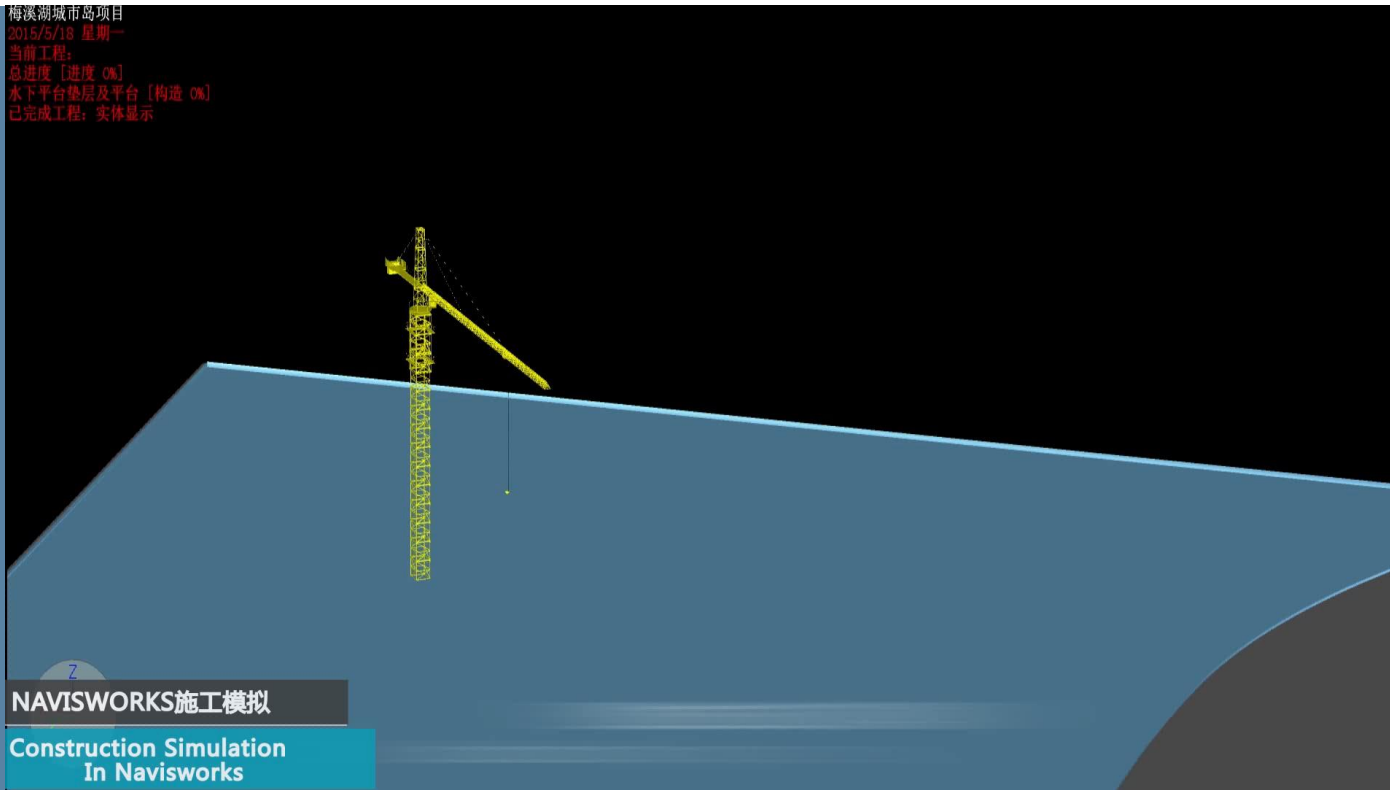
02 VENUE LAYOUT

HNCEG

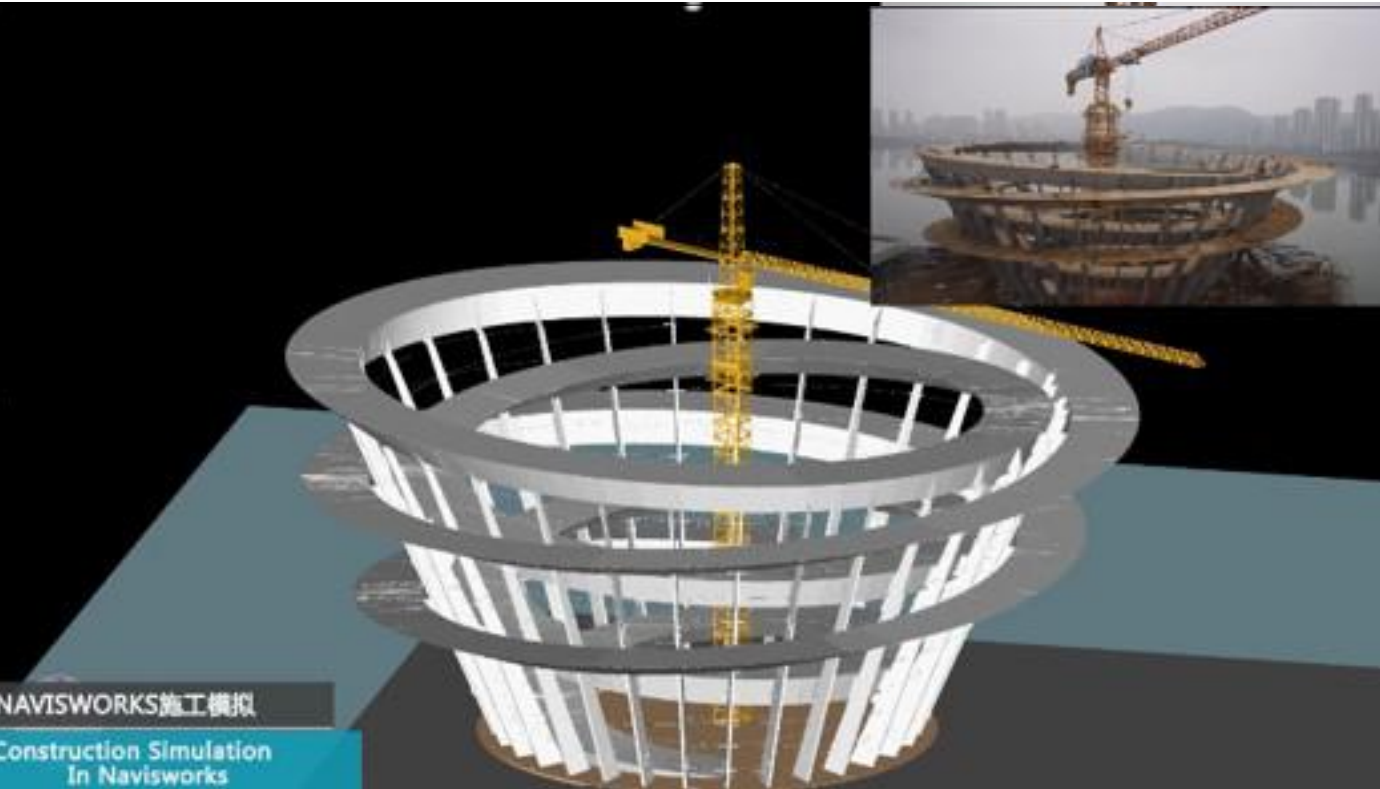
The four monomers of the project were conducted together. There were only one construction channel into and out the island. Reasonable arrangement of dynamic construction site is the foundation of the follow-on construction.

03 PROCESS ANALOG

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- Pre-stress square pile construction
- Lake dam masonry
- Helix foundation pouring
- Inclined column hoisting
- Loop road hoisting
- V-type pier concrete pouring
- Triangular truss hoisting
- Decoration construction

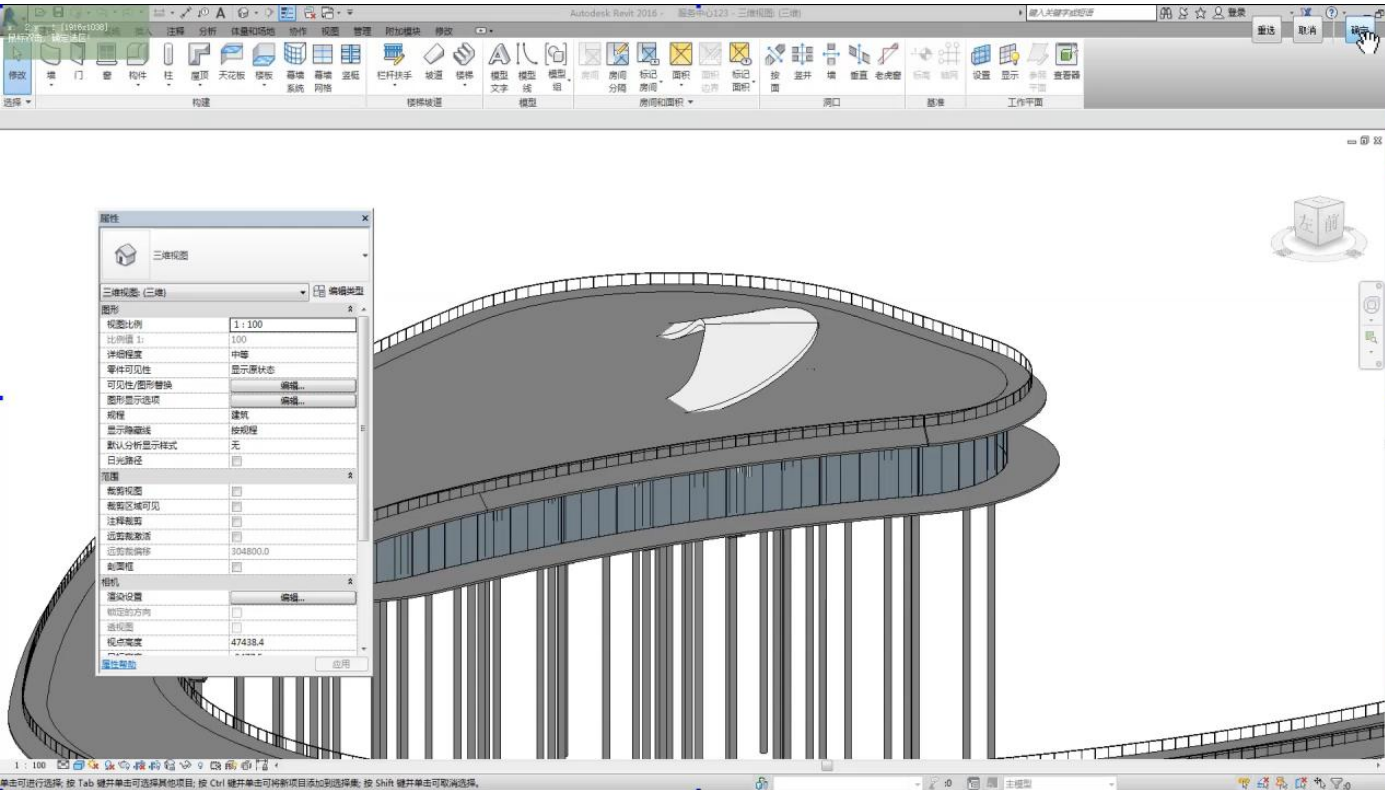


Function 1 :
Arrange construction progress

Function 2 :
Select hoisting machinery

Function 3 :
Determine hoisting sequence

05 VISUALIZATION CLARIFICATION



Step1:build complex node model

Step2:create three-dimensional animation

Step3:conduct technical clarification



↗ Improve the quality and efficiency of technical clarification.

Set up BIM data into a file that can be
Uploaded into the cloud
measurement control network

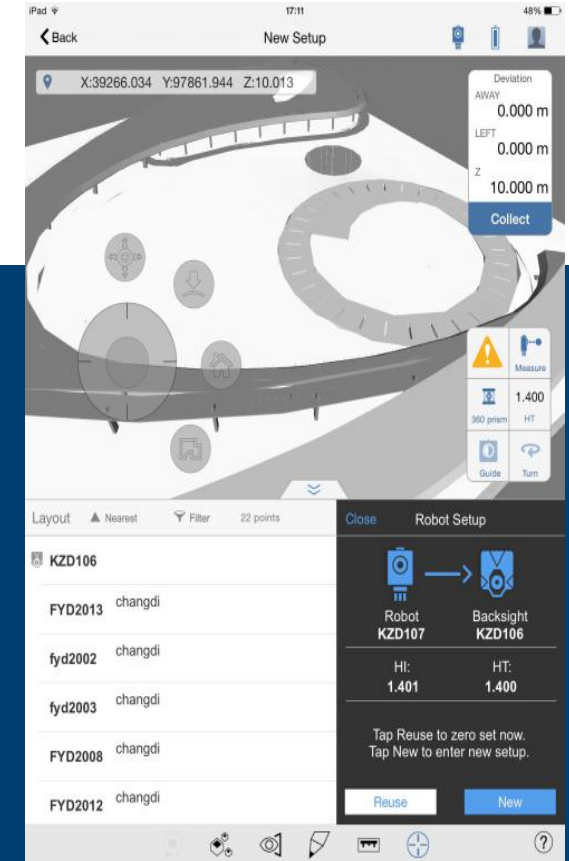
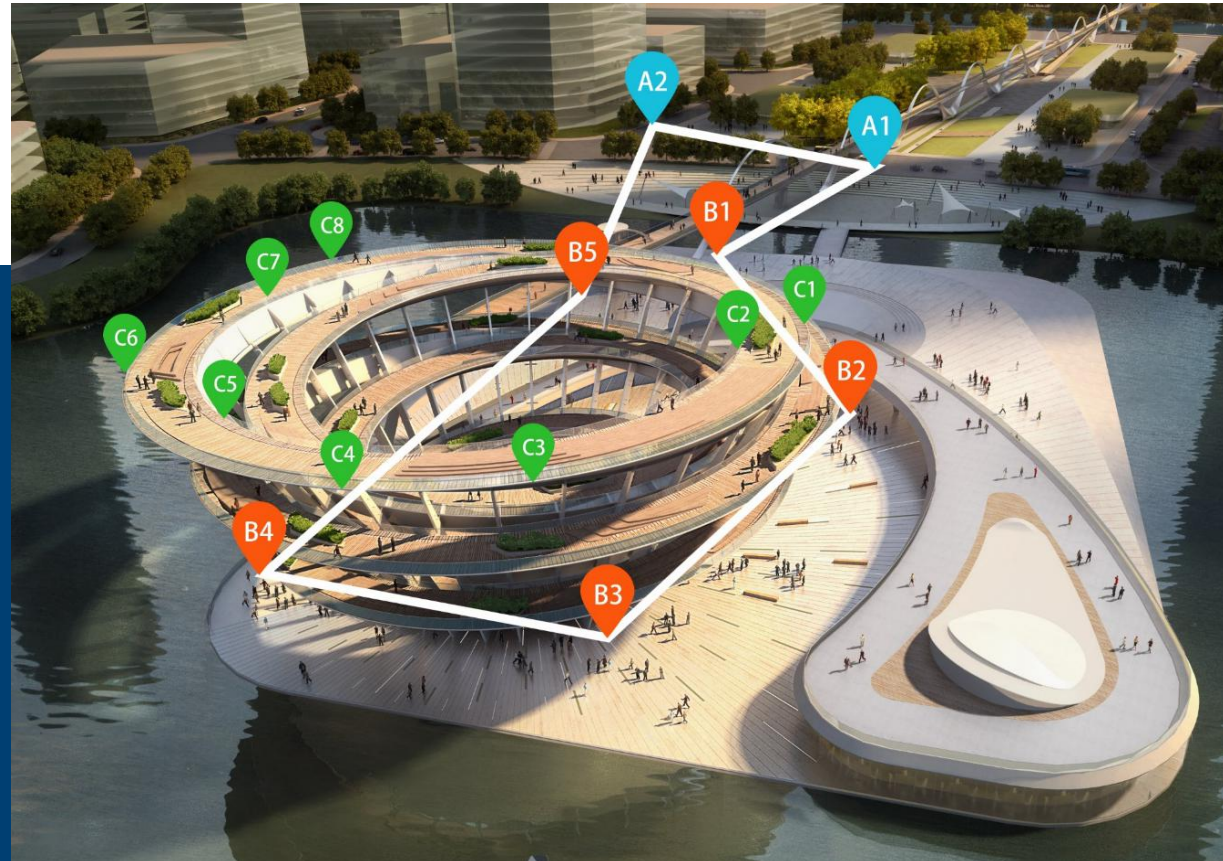
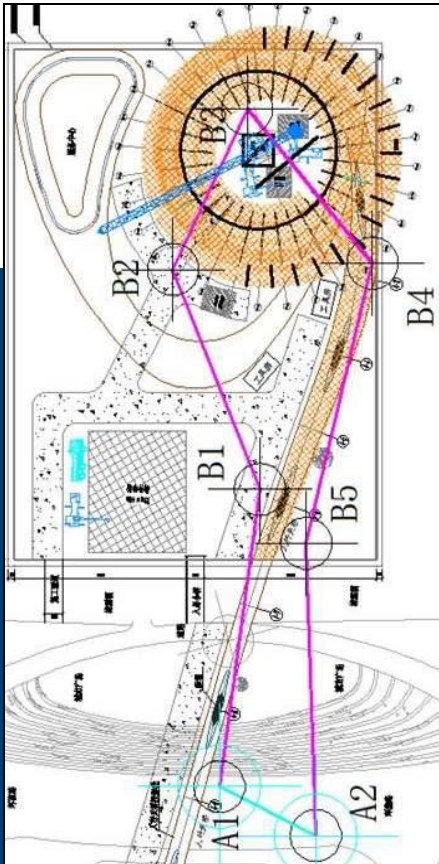
SEVEN



06 BIM MEASUREMENT

Build construction measurement control network

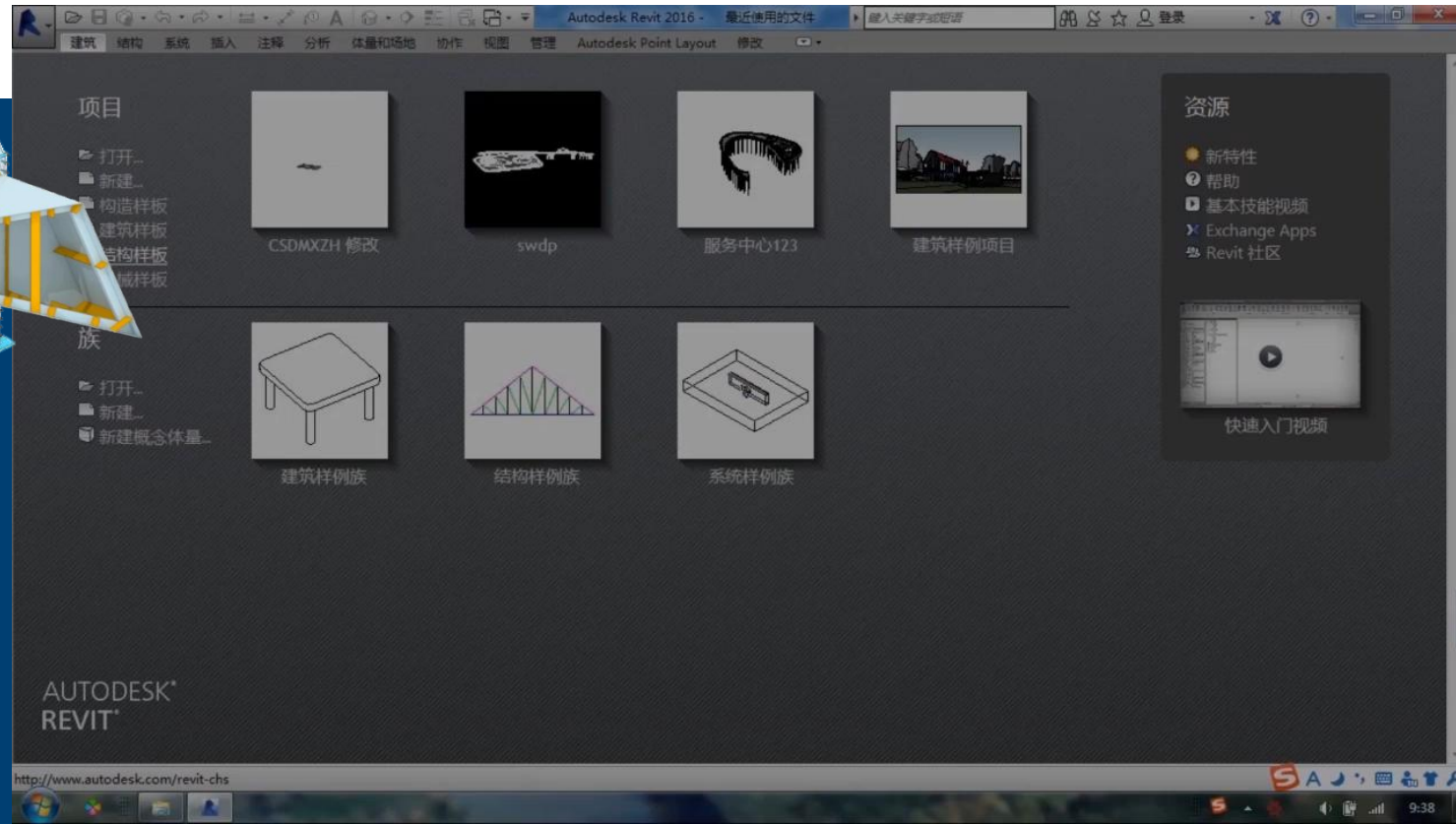
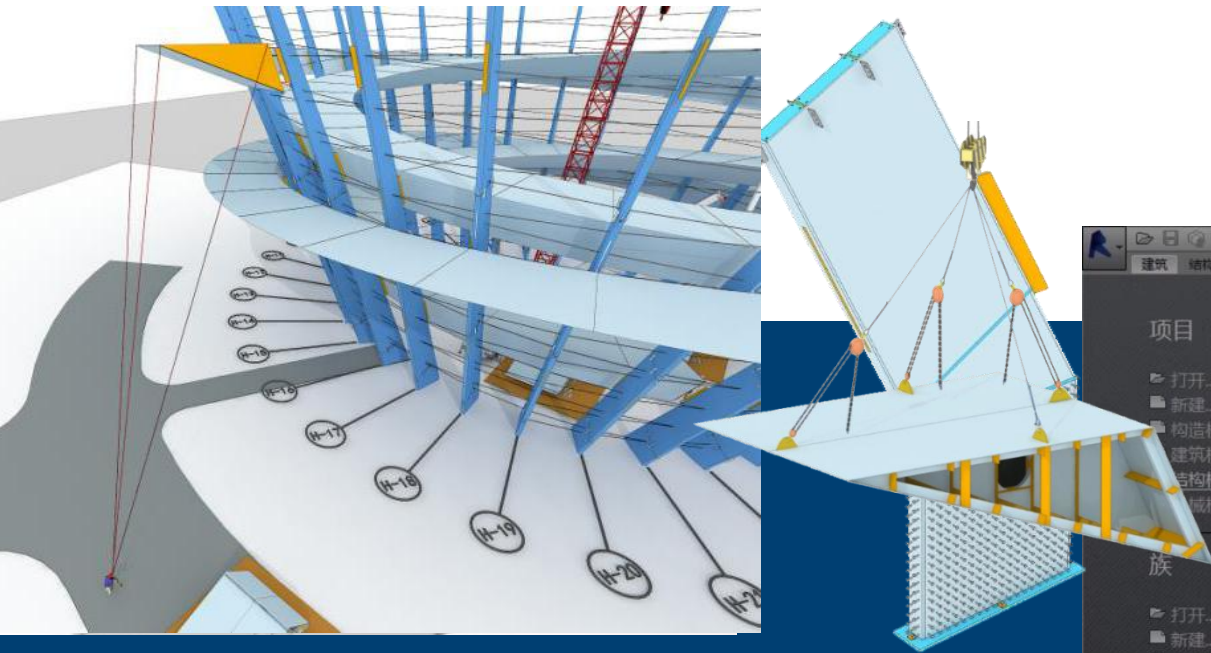
1



06 BIM MEASUREMENT

Setup point location model

2

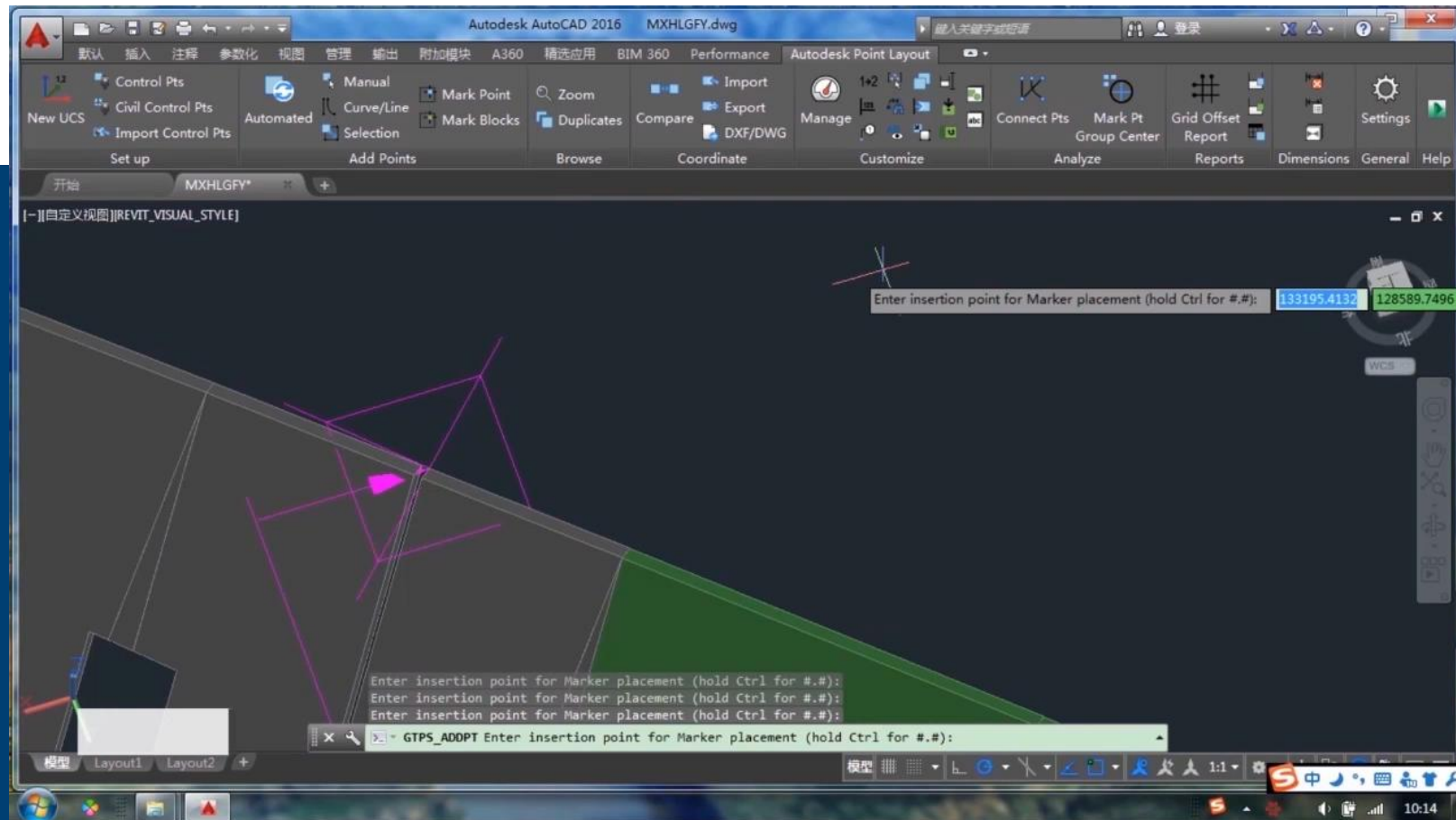
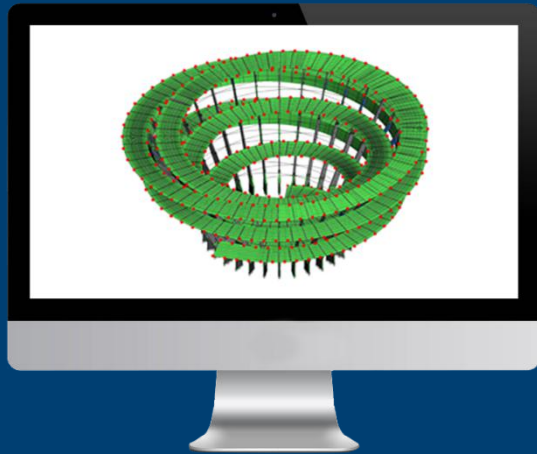


Locating point to find column

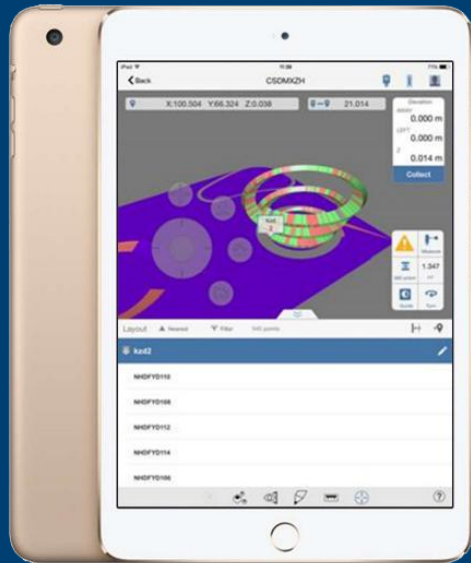
06 BIM MEASUREMENT

Upload data model to the cloud

3



06 BIM MEASUREMENT



Download cloud data model

4



Autodesk BIM 360 Glue

AUTODESK BIM 360 GLUE Ok_95324c84 Mxh

mxh

Merged Models + New merged model

- Merged Model

Models + Upload models

- MXHFY.dwg
- Mechanical.dwf

Activities

- Heming Li downloaded Model MXHFY.dwg 2016/6/19 3:09
- Heming Li uploaded New Model MXHFY.dwg 2016/6/19 3:08
- Sample User added view 'Entrance View' 2013/5/8 22:10
- Sample User created merged file 'Merged Model' 2013/5/8 2:56
- Sample User uploaded new model 'Mechanical' 2013/5/8 2:50
- Sample User uploaded new model 'Architectural' 2013/5/8 2:50
- Sample User uploaded new model 'Structural' 2013/5/8 2:50

(100%) Uploaded

Uploading "MXHLGFY.dwg"

Cancel

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4:33

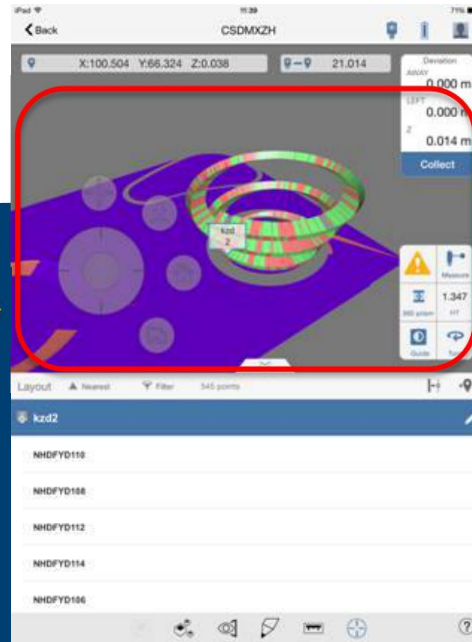
06 BIM MEASUREMENT

Setup measurement station

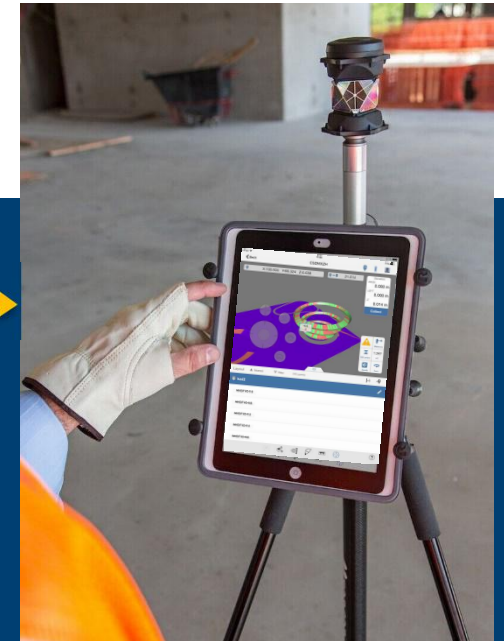
5



W-LAN technical data connection



model matches actual coordinate



Auto-lifting

6



High Efficiency

Precision

BIM-ization



Intelligent verification

7

No.	Structural Parts	key point of measurement and monitoring
1	Helix	embedded installation control
2		trails ground assembling control
3		component installation control
4		deformation monitoring and installation control
5	Pedestrian bridge	truss assembling control
6		embedded parts and bearing installation control
7		structure installation control
8		deformation monitoring and installation control



Measurement robot

Vs



Automatic sighting total station

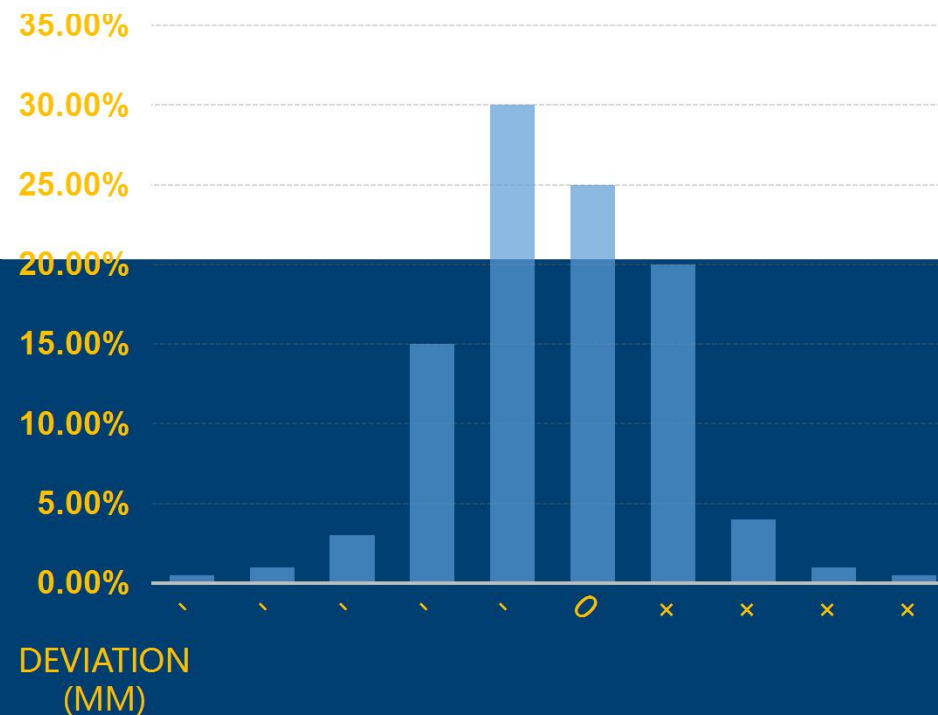
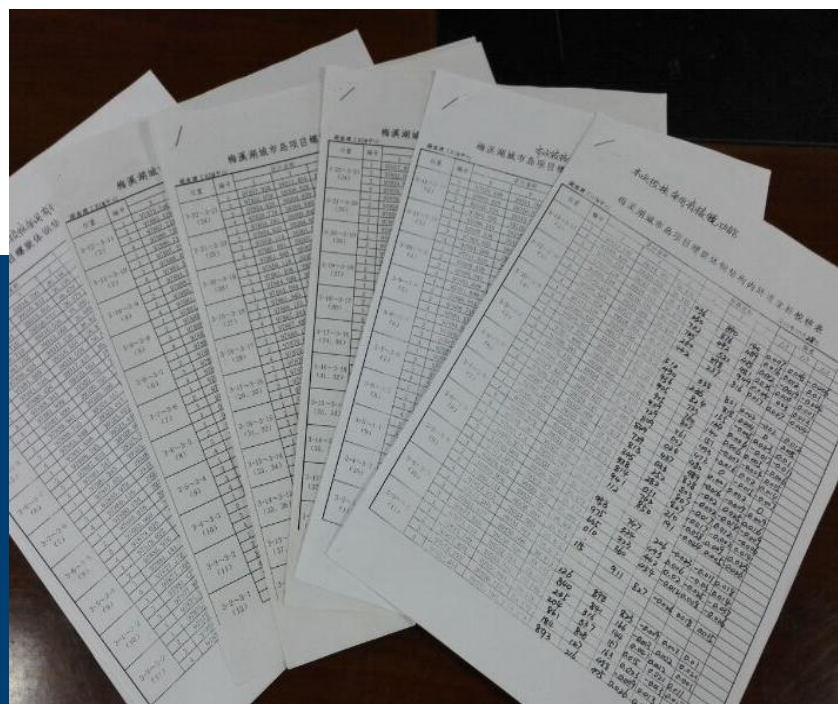
Intelligent verification

7

内环道坐标校核点 - 记事本

文件(F) 编辑(E) 格式(O) 查看(V) 帮助(H)

A1,	39327.415,	97853.790,	36.018
A2,	39302.986,	97865.598,	36.025
A3,	39338.703,	97869.753,	36.026
A4,	39309.080,	97885.709,	36.011
TP1,	39331.716,	97883.624,	36.011
TP2,	39337.618,	97879.250,	35.998
TP3,	39313.081,	97886.973,	36.005
TP4,	39327.581,	97851.718,	36.021
2-1,	39314.700,	97879.546,	36.146
2-2,	39310.832,	97885.429,	36.146
2-3,	39313.864,	97887.234,	36.479
2-4,	39316.511,	97880.708,	36.479
3-1,	39316.516,	97880.710,	36.480
3-2,	39313.868,	97887.236,	36.480
3-3,	39317.230,	97888.425,	36.812
3-4,	39318.554,	97881.509,	36.812
4-1,	39318.558,	97881.510,	36.813



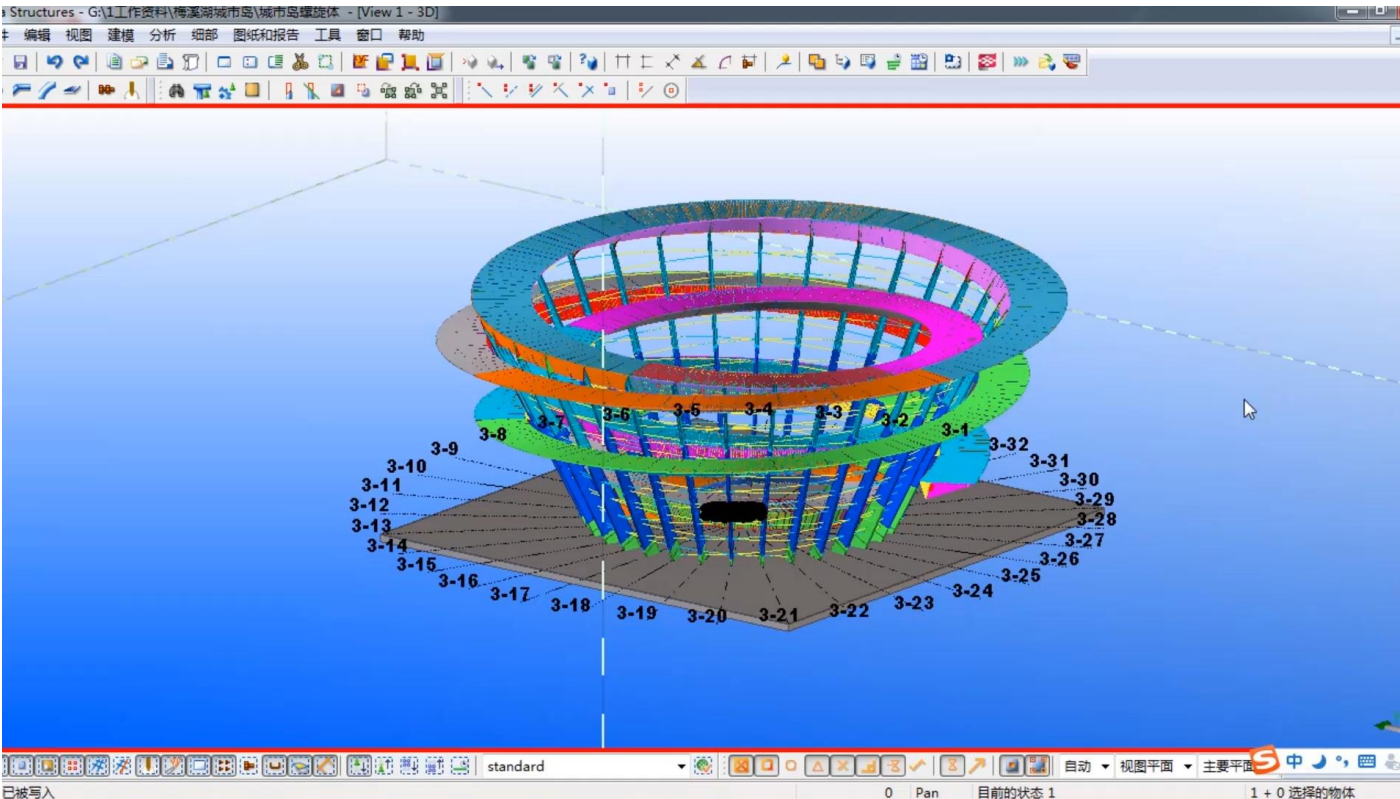
Data collection

Data check

Data analysis

07 PREFABRICATION

CNC programming



SmartNest企业版[套料编程] - [hhq1-数控-Q370qE-δ24.out (材质Q370qE 板厚24.0 规格13000*2700)]

文件(E) 套料(A) NC编程(G) 余料(M) 报表(P) 设置(S) 窗口(W) 数据库(D) 帮助(H)

打印机设置... Ctrl+P

13000

hhq1-数控-Q370qE-δ24-004.out (材质Q370qE 板厚24.0 规格12000*2700) x 1

下料作业指导书 第 1 / 1 页

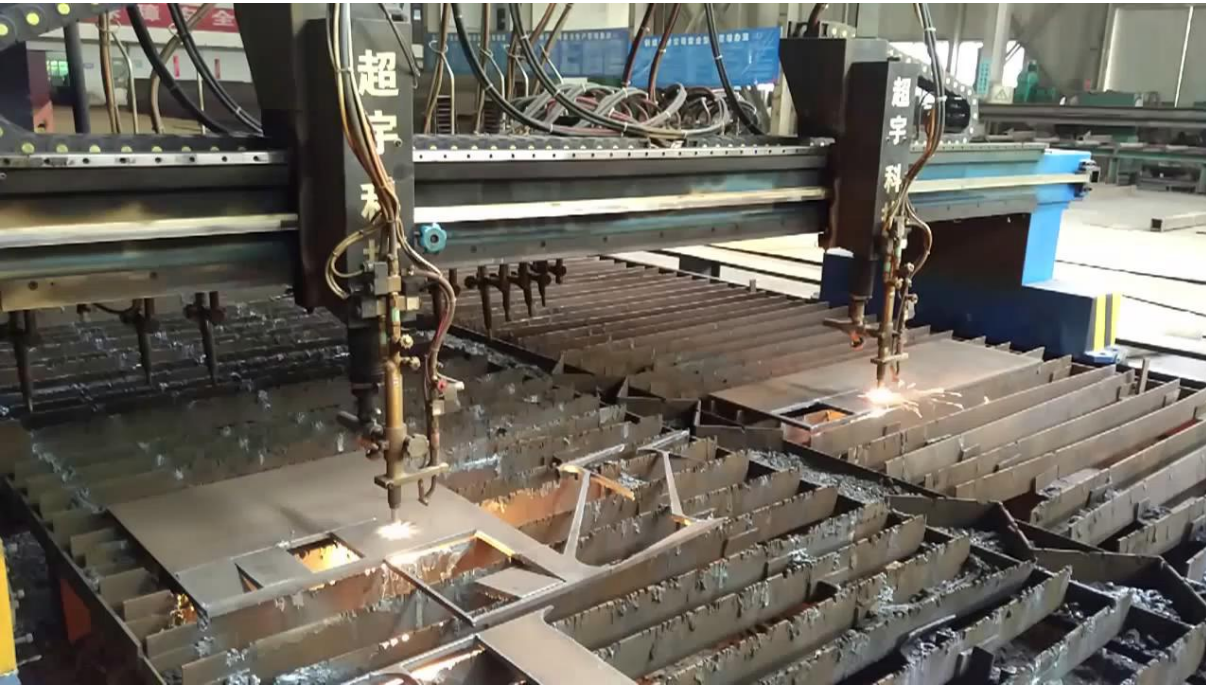
序	零件名称	零件图号	数量	净重(kg)	毛重(kg)	工时	定额	周长(m)	面积(m ²)	零件规格	成本
1	切割零件	XN64	1	0.000	5036.789	57.66	5383.27	57.657	26.735	10380x2600	0.00
2	切割零件	XM116	1	0.000	226.518	8.35	242.10	8.353	1.202	1600x764	0.00
3	切割零件	XM128	1	0.000	106.738	6.98	114.08	6.983	0.567	1000x800	0.00
4	切割零件	N90	1	0.000	55.558	3.36	59.38	3.360	0.295	1494x200	0.00
5	切割零件	XM17	1	0.000	59.158	3.92	63.23	3.924	0.314	700x500	0.00
6	切割零件	XN37	1	0.000	226.518	8.13	242.10	8.133	1.202	1600x764	0.00
总计			6	0.00	5711.28	88.41	6104.2	88.41	30.31		0.00

钢板: 12000x2700x24.0(Q370qE) 数量: 1张 边框: 10.0 缩放: 0.0, 0.0, 0.0 切速: 1000 利用率: 93.6%

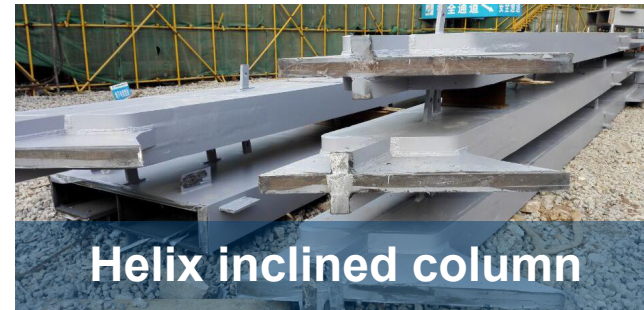
用户: 智格科技【SmartNest】

07 PREFABRICATION

NC machining



Helix circular ramp



Helix inclined column



Pedestrian Bridge deck truss

**What economic
benefits can it bring?**

05 ECONOMIC BENEFIT ANALYSIS

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 Improve work efficiency

 Reduce secondary transport

 Reduce procedure rework

 Improve work efficiency

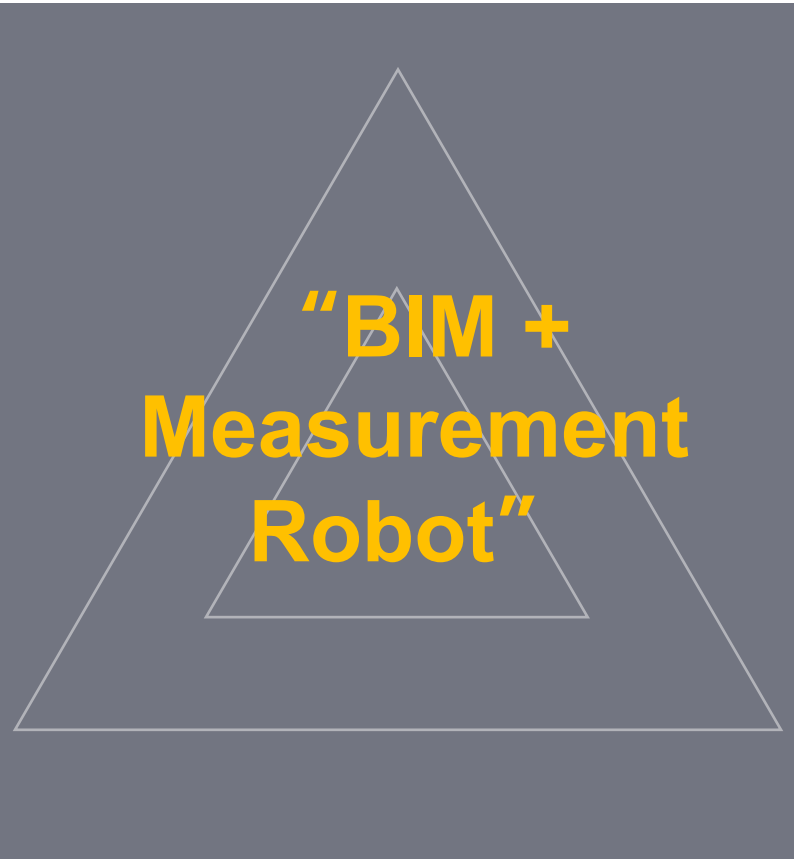
 Decrease material wastage

 Organize flow construction





Core Value



**“BIM +
Measurement
Robot”**

1

Realize the space positioning of complex abnormal structure

2

Lift the lofting efficiency 50% above

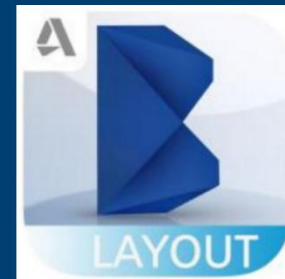
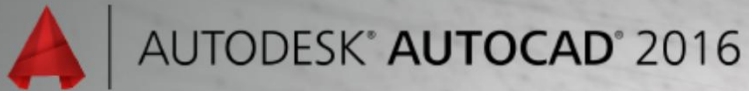
3

Control the lofting precision within $\pm 5\text{mm}$

4

Realize the informatization management & control

Thanks for the support from the following softwares



HNCEG

Questions are invited

THANK YOU

Thanks for watching